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THE DENTAL Digest

APRIL 1944

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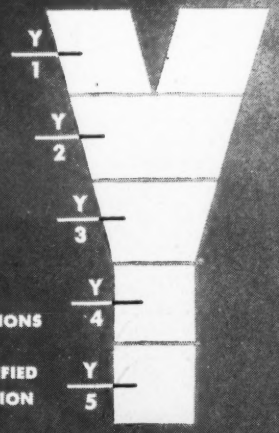

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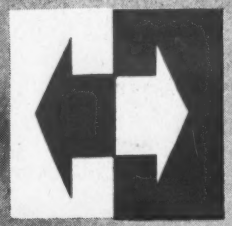

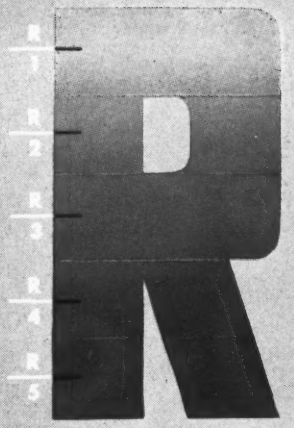

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Assume for the moment that the tooth appears to be yellow of approximate saturation No. 2 (Veri-chrome Color Y2). * * * * * *

Now, using the Color Guide, use R2 for comparison *instead* of Y2. If the natural tooth appears to be yellow by contrast—then the original judgment of hue was correct. If it doesn't appear yellow by contrast—then the original judgment of hue was incorrect.

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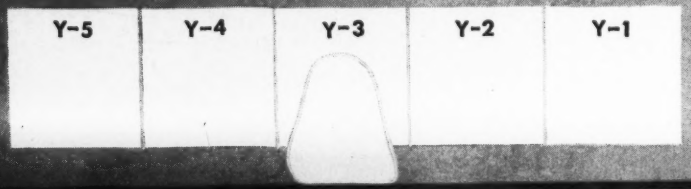

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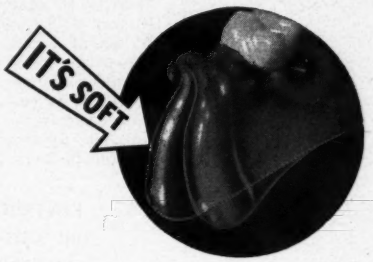

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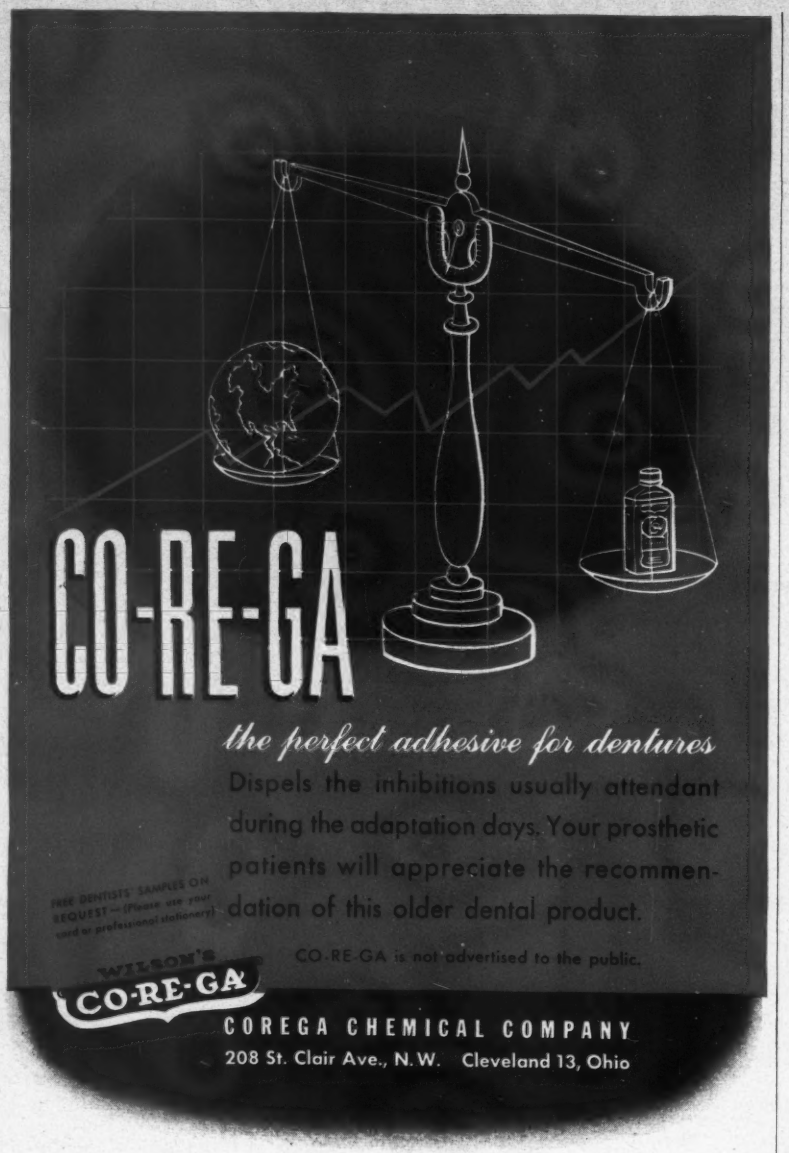
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VOL. 50 NO. 4

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IRWIN ROBERT LEVY, D.D.S. (New York College of Dentistry, 1918) is a general practitioner. In November 1937 Doctor Levy wrote for us on DENTAL ELECTRO FORMING; his textbook for dental assistants was published in 1942. His present article is ACCURATE GOLD INLAYS BY THE USE OF A WAX SOLVENT.

PHILIP P. NOVER, D.D.S. (Columbia University, School of Dental and Oral Surgery, 1921) is in general practice. He has done research work in acrylics for about four years. He describes here his technique for direct acrylic restorations.

JOSEPH M. PURCELL, D.D.S. (Temple University, School of Dentistry, 1917) is in general practice. Doctor Purcell presents his technique for constructing the "semi-palateless" upper denture.

CHESTER J. HENSCHEL, D.D.S. (New York College of Dentistry, 1929) presents four practical ideas in his series of CLINICAL AND LABORATORY SUGGESTIONS: VIBRATING THE INLAY PATTERN; REMOVING THE DIRECT WAX PATTERN; PAINLESS CAVITY STERILIZATION OR MEDICATION; AND A SMALL BUR FOR REMOVING INLAY NODULES.

G. RIDGLEY PARKER, D.D.S. (College of Physicians and Surgeons, School of Dentistry, 1925) is in general practice. In September 1943 he wrote for us on ACRYLIC INLAYS. This month his article is ACRYLIC INLAYS FOR GINGIVAL CAVITIES.

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Accurate Gold Inlays By the Use of a Wax Solvent

IRWIN ROBERT LEVY, D.D.S., New York City

DIGEST

The technique described here, whereby the inlay pattern is dissipated by means of a wax solvent, is simple and time-saving; each step is explicit, designating an exact time and temperature. Remarkably accurate castings result; the surfaces are smooth and bright in contrast to the frequent dull, rough surfaces of those in which the wax is eliminated by the "high temperature" method.

Investing the Wax Pattern

1. Prepare the cavity carefully in accordance with the accepted rules for this operation. See that it has proper form, with all margins bevelled and no undercuts.

2. After the cavity is prepared, make a wax pattern by either the direct or the indirect method, and attach a sprue pin. (I have found that a heavy gauge pin is highly advantageous, especially if a centrifugal casting machine is used.)

3. Attach a ball of wax to the sprue pin (Fig. 1), to form a reservoir to prevent premature "freezing" of the gold in the sprue hole during casting. Premature "freezing" of the gold would result in a deficiency in the finished inlay.

4. Invest the pattern in the usual manner. (I prefer to use Kerr's Cristobalite.)

Wax Elimination

I believe that eliminating wax from inlay patterns by causing evaporation of the wax by the application of heat is inexpedient and scientifically unsound. It is more logical to eliminate the wax by dissolving it. There are many disadvantages in using a high temperature for this purpose, not the least of which is the damage which excessive heat inflicts on an inlay investment. The following experiment will prove that wax can be better eliminated by using a solvent:

1. Make a mix of inlay investment; and from it fashion two slabs, each about 1 inch square and ½ inch thick.

2. Place one slab in the inlay furnace, and raise the temperature to that at which casting is usually done (1350° F.).

3. Subject the other test specimen to only 650° F., which is the temperature at which casting is done in the technique described in this article.

4. After the specimens have cooled, prod each with an instrument. The block which was subjected to the high temperature crumbles and disintegrates readily. The block to which the lower temperature was applied maintains its integrity.

This would indicate that excessive heat drives off some of the water of crystallization from the investment, causing it to tend to become amorphous. The heat may also have a destructive effect on the plaster of Paris which acts as a binder in the investment.

Wax Solvent

I have found that boiling carbon tetrachloride is most efficient and practical for this purpose because it is noninflammable and nonexplosive, as well as potent as a wax solvent. To test the capacity of this chemical as a wax solvent, drop a bit of inlay wax into a test tube of carbon tetrachloride and hold it for a moment over the flame. (Carbon tetrachloride boils at a low temperature.) The wax will disappear rapidly. Immersing an invested inlay pattern in the same solution for a few minutes will cause complete dissolution of all the wax but, as a precautionary measure, I recommend immersion of the pattern for 10 minutes. Many experiments, in which molds were submerged in the solution for this length of time and were then cut open and examined, have proved that all the wax disappears after this treatment, leaving the margins of the mold sharp and clearly defined.

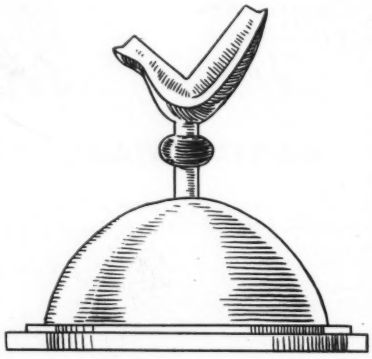

Fig. 1—Inlay pattern ready for investment.

Drying and Expansion

After all the wax has been removed, it is necessary to dry and to expand the mold to secure a casting which fits properly. If moisture is allowed to remain in the investment, the formation of steam will cause a casting failure. Expansion is necessary to counteract the shrinkage of the molten gold upon cooling. Both adequate drying and expansion can be achieved simultaneously by heating the mold, gradually elevating the temperature to 650° F.

Fig. 2 demonstrates the expansion of Cristobalite at different temperatures. It shows that the coefficient of expansion at 650° F. almost equals that at 1350° F. Under the high temperature system, it is taught that sufficient heat has been applied "when the sprue hole is cherry red." This index is not exact; no two technicians see the color at the same temperature. One may not see the necessary color until the inlay ring itself reddens and glows, which would indicate a temperature of 1600° F. or more. At such

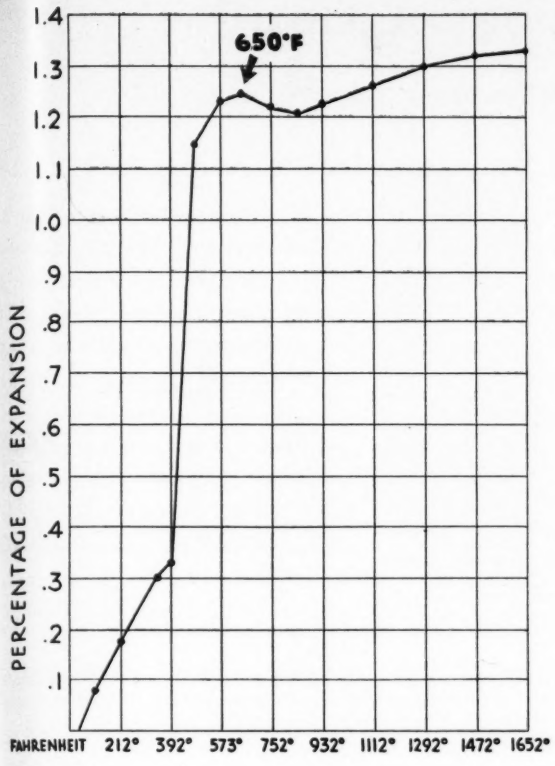

Fig. 2—Percentage of expansion of Cristobalite at different temperatures.

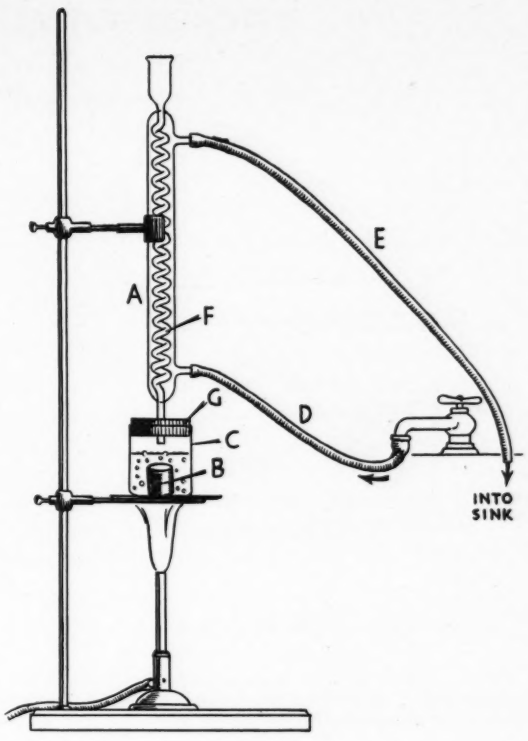

Fig. 3—Graham condenser used to get rid of noxious, malodorous gases given off by boiling carbon tetrachloride. (See text.)

a high temperature, the cohesiveness and integrity of the investment might well be destroyed.

Controlling Noxious Vapors

To get rid of the noxious, malodorous gases given off by boiling carbon tetrachloride, I use a Graham condenser (Fig. 3). The invested wax pattern (B) is placed in a rubber-stoppered beaker (C) (one without a pouring lip), which contains carbon tetrachloride. The tapering end of the glass condenser (A) fits into a hole drilled into the rubber stopper (G). Rubber tubes are attached to two outlets on the condenser. One tube (D) is attached to the cold water faucet, and the end of the other tube (E) is dropped in the sink to take care of the overflow. Cold water circulating through the outer jacket chills any vapor arising in the coil, causing it to condense and drop back into the beaker. Unless too vigorous boiling is permitted, no vapors will escape.

Technique

1. Sprue the wax pattern, using a heavy sprue pin, and attach a ball of wax to the sprue pin to act as a reservoir.

2. Invest the pattern in a thoroughly spatulated, thick mix of investment.

3. After the investment has set, remove the sprue pin and place the inlay ring in carbon tetrachloride. With cold water circulating through the outer jacket of the condenser, apply a low flame to the beaker containing the carbon tetrachloride and boil for 10 minutes.

4. The next step may be achieved in any one of three ways:

a) Place the mold in a furnace which is equipped with a pyrometer (Fig. 4A), and slowly raise the temperature to 650° F. Maintain this temperature for from 10 minutes to 15 minutes, and cast the inlay.

b) Place the inlay ring over the flame of a Bunsen burner, and rest a high heat thermometer in the crucible (Fig. 4B). When the thermometer indicates a temperature of 650° F., the inlay may be cast.

c) Recently a lacquer (Tempilac) has been developed and manufactured for the observation of surface temperatures. This lacquer, which is available in the range of 125° F. to 700° F., is said to have an accuracy of within 1 per cent of the stated melting point. Place the inlay ring over the flame of a Bunsen burner with the sprue hole turned down. Put a drop of 650° F. Tempilac in the center of the investment (Fig. 4C). When the lacquer melts, forming dark shining beads, the proper temperature has been reached and the inlay may be cast. This is the method of choice because of its simplicity.

Advantages of Technique

1. Well fitting inlays are produced.

2. The surfaces of the inlays are clean and smooth.

3. Less time is consumed.

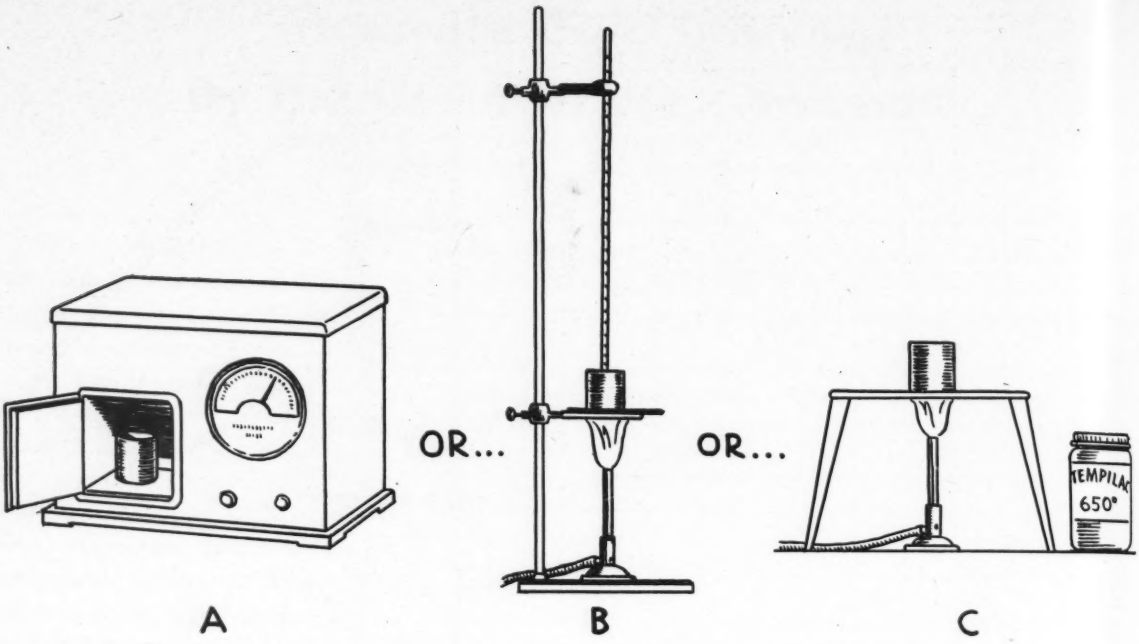

Fig. 4—A, Inlay mold in furnace equipped with pyrometer which indicates temperature for casting inlay. B, Inlay mold over Bunsen burner flame; when thermometer indicates 650° F., inlay may be cast. C, Melting of 650° F. Tempilac applied to investment indicates proper temperature for casting inlay.

4. The technique is more concise because a set time for wax elimination and a definite temperature for casting are provided.

Technique with Acrylics

1. A wax pattern is made and flasked in the usual manner of preparing acrylic crowns, inlays, and bridges.

2. The flask is then opened, and the lower half is placed in boiling carbon tetrachloride until all the wax is removed.

3. After the flask is washed with cold water, acrylic may be packed and cured.

Physical Properties

Tests have been conducted to determine the physical properties of gold castings made by this method as compared with those made by the high heat technique. Two wax rods were invested, using the same mix of investment material. The first (Flask 1) was placed in a furnace and heated to 1350° F. The second (Flask 2) was immersed in carbon tetrachloride and then heated to 650° F. Both were carefully cast in the same type and quality of gold. The results of the test are indicated in the foregoing table.

Flask	Ultimate Strength	Elongation	Appearance of cast
No. 1	46,500 lb. per sq. inch	27%	Rod oxidized
No. 2	49,500 lb. per sq. inch	25%	Natural color retained

This test proved that the ultimate strength and ductility of castings made by the two methods were almost identical. The rod which was cast after being subjected to the higher heat appeared to be oxidized; it was dull and blackened. The rod cast by the method advocated was bright and shiny. The first rod was oxidized when sulphides were liberated from the investment during the application of excess heat.

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Unsolicited Manuscripts Are Welcome

"When you have made an observation of value or reached a conclusion concerning the unusual, publish it. Avoid carrying unpublished knowledge to the grave!"—Sir William Osler.

Direct Acrylic Restorations

PHILIP P. NOVER, D.D.S., New York City

DIGEST

A technique is presented for inserting a direct proximal or gingival acrylic restoration. The special acrylic material can be used successfully provided that the cavity is not too extensive, is completely surrounded by supporting walls, and has well defined undercuts. It is advised that an operator be familiar with the technique of handling the material before attempting to use it for large compound cavities.

THE USEFULNESS OF the methylmethacrylates for the construction of bridge pontics, jacket crowns, and inlays is well known to the dental profession. The development of a special acrylic material for direct restorations is the result of years of experimentation with the production of methylmethacrylates for inlay and denture techniques. The product is so new, however, that we must still consider it to be in the experimental stage. A new product is often tried in cavities under conditions which are not favorable for its use only to "dare" the product to survive the abuse. Because of these trials under adverse conditions, we can eventually determine the limitations of such a material.

It is now possible to insert an acrylic proximal or gingival restoration which is hermetically sealed in the cavity without the need for a cement binder, and which blends perfectly with the color of the tooth. I can recommend the use of this direct acrylic restoration material for both proximal and gingival cavities, provided that the cavities are not too extensive, are completely surrounded by supporting walls, and have well defined undercuts. I have used direct acrylic restorations successfully to construct large cervical restorations and compound proximals. I would not advise the use of the material for large compound cavities, however, until further experience with the technique of handling the material has been gained.

Fig. 1—Matrix impression of tooth with temporary stopping in place.

Advantages

1. There is less destruction of tooth structure because of the simple cavity preparation.

2. Absolute security of the acrylic restoration is insured by retention undercuts in the cavity.

3. The finished acrylic restoration matches the tooth perfectly inasmuch as the polymer powders are premixed and preblended to conform to the standard New Hue shade guide.

4. The polished, completed acrylic restoration has a smooth, enamel-like surface which is not affected by mouth fluids and will not wash away.

5. The acrylic restoration is a nonconductor of heat, thus protecting the pulp from thermal shock.

6. The elimination of any cementing medium is a great advantage inasmuch as the cement binder is often the weak link in the cementing of a small inlay, especially in gingival cavities.

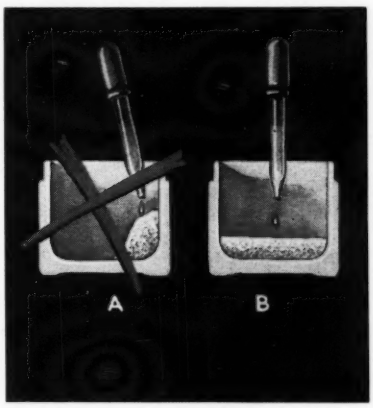

Fig. 2—Do not pour methylmethacrylate powder (polymer) in heap; spread it in an even layer in bottom of jar. Add liquid (monomer) drop by drop.

Technique for gingival direct acrylic restoration.

Cavity Preparation—Prepare the cavity in the same manner as for the insertion of an amalgam restoration, with proper undercuts for retention.

Matrix Impression—1. Fill the cavity with temporary stopping to overfill it slightly.

2. Chill and dry the surface of the tooth and the temporary stopping, and lubricate the entire surface with cocoa butter or any lubricant of choice.

3. Soften a piece of modeling compound and press it against the entire surface of the tooth and the stopping, using sufficient compound to include the surfaces of both adjacent teeth.

4. Chill, and remove the impression matrix and set it aside for later use (Fig. 1).

5. Remove the temporary stopping and clean the cavity.

Pulp Protection—After the cavity has been sterilized and thoroughly dried, coat the pulpal wall with a liquid liner which will dry rapidly. The regular cavity liners cannot be used with acrylic restorations because they have an undesirable solvent action on the acrylic material.

A protective covering of some kind must be placed over the pulpal wall to prevent any possible deleterious ac-

tion of the monomer. Inasmuch as the regular liquid lacquers could not be used, it became necessary to develop a special solution which would form a protective film that could be tolerated by both the tooth and the acrylic. This liquid film may be used with any material; the trade name is Plasto-Lac.

Drying the Cavity—Dry the cavity liner with low pressure air blasts from the warm air syringe. Do not hold the nozzle of the air syringe too close to the cavity; too strong a blast of air will displace the liquid film before it has become firm. The cavity should now be dry and ready to receive the acrylic material.

Polymer—Prepare the material by pouring a small quantity of the powder of the desired shade into a small porcelain jar. A small empty cold cream jar will serve the purpose. Do not pour the powder in a heap; spread it in an even layer in the bottom of the jar (Fig. 2).

Monomer—Add sufficient liquid, drop by drop, upon the powder to thoroughly saturate the powder, but do not "drown" the powder (Fig. 2). It is advisable to direct a few blasts of air against the wet mass of powder in the jar, in order to eliminate the surplus liquid (Fig. 3). Direct the air gently against the wet mass until the glossy appearance has disappeared. Here again, however, caution must be exercised so as not to blow the entire mix out of the jar.

Polymerization Time—Close the jar, or turn the jar upside down, and allow it to stand for approximately 2 minutes. The wet mass will adhere to the base of the jar and will not drop off when the jar is inverted. The waiting time may be cut to 1½ minutes in a warm room temperature.

Mix—Knead the wet mass thoroughly with the flat surface of a stainless steel cement spatula for approximately 15 seconds. The time element is important, but it is of greater importance to be able to recognize the correct consistency stage. Inasmuch as the time may vary depending upon the temperature of the room, it is advisable to be able to detect the proper setting stage.

Stages of Polymerization—The setting period passes through three stages:

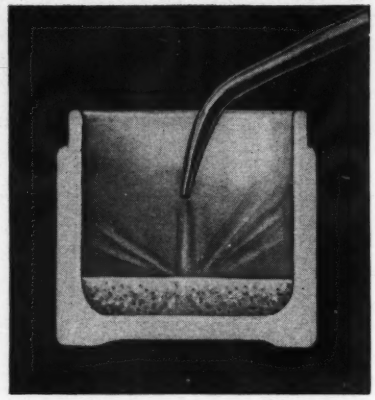

Fig. 3—Air directed against wet acrylic mix to eliminate surplus liquid.

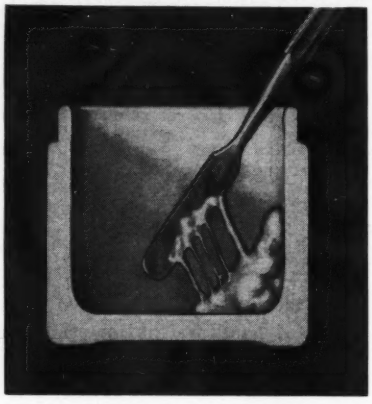

Fig. 4—Acrylic mix in working stage: Fibrous strands pull out when spatula is lifted from mix.

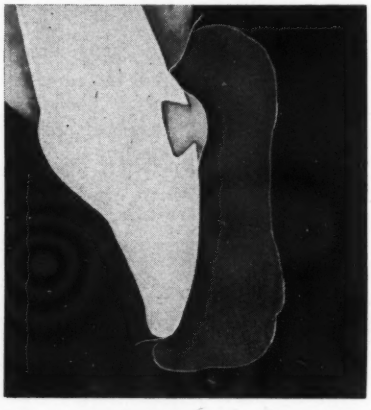

Fig. 5—Compound matrix applied over cellophane covering acrylic restoration.

1. Sandy Stage: This occurs immediately after the powder and liquid have been combined. The mix will feel crunchy, like wet sand, when mixed with the spatula.

2. Working Stage: This occurs about 2 minutes after the liquid is introduced into the powder. The wet mass loses its sandiness and becomes a more homogeneous mix with a slightly tacky quality. When the spatula is lifted from the material, slight fibrous strands will pull out (Fig. 4). This is the proper consistency for use.

3. Rubbery Stage: This occurs about 2 minutes after the working stage. The mix becomes a smooth homogeneous mass which is pliable and which will return to its original form when it is bent or twisted. The material cannot be inserted in the cavity in this state; it would spring away from the walls of the cavity immediately upon being inserted.

Insertion of Material—Insert a mass of the tacky acrylic mix (second stage of polymerization) into the tooth cavity which has been kept dry and sterile by the cavity lining. Sufficient material should be used to slightly overfill the cavity. It is advisable to place the acrylic into the cavity in one piece instead of in small portions.

Applying Matrix—Place a small piece of lubricated tin foil (.001 gauge) or a piece of cellophane over the acrylic. Apply the compound matrix over the foil or cellophane, and press firmly to place (Fig. 5). Hold the matrix in this position for 5 minutes.

Examining for Polymerization—After 5 minutes have elapsed, remove the matrix and the foil or cellophane lining, and examine the acrylic material for signs of the beginning of polymerization. The excess which has been squeezed out around the periphery of the cavity will begin to dry. If the surface does not yet appear to be dry and slightly stiff, wait a few more minutes, hastening the process with light blasts of warm air.

Removing Surplus—When the initial superficial polymerization has occurred, as evidenced by the dry appearance, remove the bulk of the excess material around the periphery of the cavity (Fig. 6). This must be done very carefully with a small sharp lancet; it is advisable to lubricate the blade before applying it to the surface of the restoration to prevent the acrylic from sticking to the

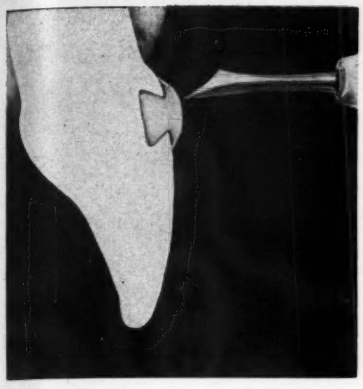

Fig. 6—Bulk of excess acrylic being removed from periphery of cavity with sharp lancet.

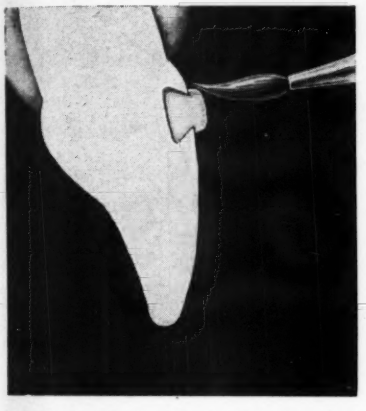

Fig. 7—Acrylic liquid film being applied to restoration and tooth as protective coat before finishing and polishing is done.

lancet, thereby being withdrawn from the cavity.

Do not attempt to remove all the excess material at this time. Cut away only that portion of the overhanging bulk which could not be tolerated by the patient until the following visit.

Applying Protective Outer Coat—Coat the entire outer surface of the restoration and the tooth with an application of the special acrylic liquid film which was used earlier as a lining over the pulpal walls (Fig. 7). Dry the liquid film with blasts of warm air, and apply a second coat in the same manner. Dismiss the patient and ask him to return in 2 or 3 days for final finishing and polishing.

Finishing and Polishing—At the next visit, polish away all surplus acrylic with fine abrasive paper discs, and finish with fine cuttlefish discs (Fig. 8). Always run the engine at slow speed to prevent overheating and softening of the restoration. Disc from the center toward the periphery. I do not recommend using an abrasive rubber wheel inasmuch as the grit in the wheel may be polished into the material; this would result in discoloration. It is likewise inadvisable to use a quick cutting stone such as a diamond point stone. The final polish is obtained with a small, wet felt wheel and tin oxide paste. Little polishing is necessary to obtain a smooth glazed finish.

Comments

The technique is the same for proximal restorations except that a lubricated stainless steel strip is used in the same manner that the celluloid strip is used for silicate restorations. No other matrix is necessary.

It is advisable to experiment with a number of mixes before actually using the acrylic in order to become familiar with the "feel" of the material. The success or failure of the final result depends chiefly upon the ability of the operator to recognize the proper working stage of the material, and to handle the material properly when that stage has been reached.

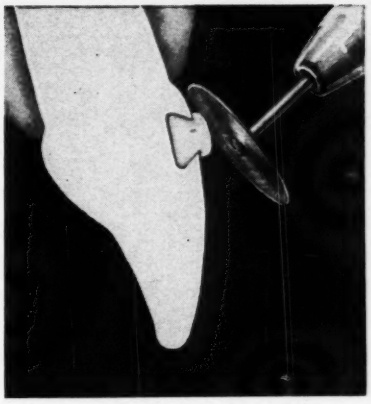

Fig. 8—Surplus acrylic being removed with fine abrasive paper disc.

I would recommend that direct acrylic restorations be limited at present to gingival, cervical, and proximal cavities. I do not advise the construction of a direct acrylic restoration in any cavity which is subject to direct occlusal stress because of the necessary polymerization period which occurs during the first 24 hours after insertion of the restoration. During this period, the restoration must not be subjected to any disturbing influences, such as masticatory stress, which might displace the material before it has polymerized into a hard, dense mass.

2 *East Fifty-Fourth Street.*

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A Technique for Roofless Dentures

JOSEPH M. PURCELL, D.D.S., Brookline, Massachusetts

DIGEST

The advantages of the "semipalateless" upper denture are listed, and a technique for its construction is described. The roofless denture is seated only on the soft mucosa; therefore, the preliminary impression is taken with a soft, yielding impression material so that the tissue is registered in a tonic state with no resultant distortion.

The edentulous areas, which are divided into zones, are studied carefully, and the mechanical principles underlying denture stability are reviewed.

SEVERAL TECHNIQUES for making roofless dentures have been advanced. Some of them have been detrimental to the health of the soft tissues; these techniques employed relief chambers on tissues. If a roofless denture, which might more correctly be called "semipalateless," is not to produce areas of irritation, it must not be lined with deep grooves or other "suction" devices. The denture should be completely and continuously tissue-bearing, seated only on the soft mucosa.

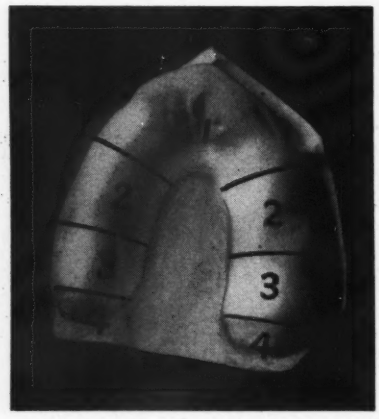

Fig. 1—Zoning of soft mucosal area in order to study periphery.

Advantages of the Roofless Denture

1. The less bulk there is in the mouth, the easier it is for the patient to become accustomed to the new denture.

2. It is easier, likewise, for the patient to become accustomed to the phonetic transfer from being edentulous to being dentulous; the introduction of a denture base naturally alters the phonetic chamber.

3. Inasmuch as surface tissues require air, the less the mouth tissues are covered, the more they should be able to retain their natural healthful condition.

4. The additional contact of tongue. food, and palate adds immeasurably to the pleasures of taste.

5. A person who is inclined to gag usually has none of this trouble with a roofless denture.

I have made semipalateless dentures for more than nineteen years and have concluded that the upper denture is secured only by contact

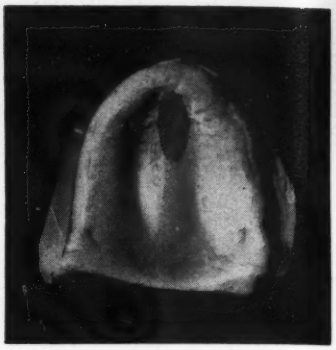

Fig. 2—Treatment of cast where hard palate extends into region of soft mucosa.

with the soft mucosa. The hard palatal area is always relieved of this task in some way, if only indirectly. Otherwise, with actual compression plus resorption of the soft mucosa under pressure of the denture, the denture would rock on the hard palate within a short time.

I do not think that the area of the soft palate, which usually receives extra treatment in the form of a deep

Fig. 3—Treatment of cast Zone I; no hard palate involvement.

Fig. 4A

Fig. 4B

Fig. 4C

Fig. 4A—Complete seal (composite of Figs. 3, 4B, 4C, 5A, and 5B). Fig. 4B—Zone II; first cut with knife blade in pen grasp. Fig. 4C—Zone II; thumb and finger grasp to widen peripheral seal slightly.

postdam, is the best area for the seating of the denture. It is difficult even to make a good impression of this tissue in a tonic state inasmuch as the patient is not breathing normally when the impression is being made. Too often after the line of postdam has been established, the base needs to be filed back because of deep impingement on the highly compressible tissue. Resultant resorption often leads to loss of contact with the soft mucosa. This permits food particles to find their way under the denture.

In order to seat the denture on the soft mucosa only, the impression must be taken so that it registers the tissue in a tonic state. There must be no compression (distortion). An impression material which is soft and yielding and which will register the soft mucosal lining without displacement of its surfaces is preferred.

Impression Technique

1. Take a modeling compound snap impression in the regulation tray.

2. Pour the cast.

3. Make a tray of double thickness baseplate.

a) The double thickness gives rigidity to the tray. This thickness is particularly desirable for the areas of the tuberosities in which an undercut might distort the form of the tray.

b) The buccal and labial periphery should not impinge upon the mucobuccal fold or attachment. Overextension of the tray in these areas distorts the natural tonic registration of these tissues. The margin (periphery) should be kept about 2 mm. below the attachments.

4. It is likewise important to define the frenal attachment by accommodating the tray with the use of a separating disc or file. The tray may accommodate the entire palatal area as in the normal procedure for a full palate coverage. It is not possible to register the area of the soft mucosa alone, inasmuch as the flow of material will spread over the rest of the palate.

5. A well built postdam of soft carding wax may be used to help prevent gagging.

6. Make seven or eight perforations with a bur in the palatal area of the tray. This reduces compression inasmuch as the overflow of material, if soft enough in consistency, will be expressed through the openings.

7. The impression material should register the soft mucosa in a tonic state without distortion of this area. The best material to use is a soft mixture of plaster of Paris or of any of the plaster derivatives. Most dentists

Fig. 5A—Zone IV; hairline seal.

Fig. 5B—Zone III; broad and flat seal; no depth.

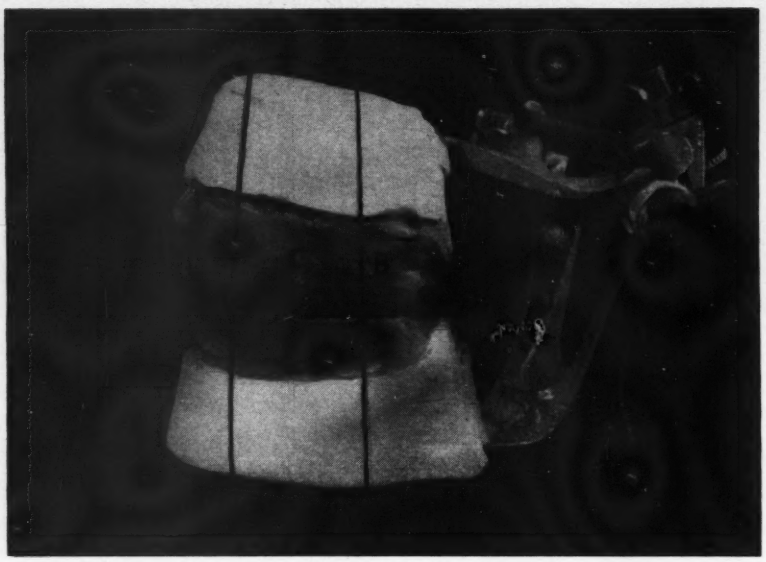

Fig. 6—Cross section of bite block areas. Area C is area of occlusion employed in mastication; only area of contact which will seat dentures.

mix plaster materials to a thick consistency for fear of inducing gagging. If the plaster is mixed too stiff, compression of the tissues results. If the patient's head is kept tilted forward with the chin downward and inward and perforations are made in the tray, gagging is almost eliminated.

8. An excellent handle may be made for the tray from a paper clip which has been heated in a flame and inserted horizontally into the anterior part of the baseplate. This handle is too small to push the lips out of place: nevertheless, it provides a solid anchorage which makes removal of the impression easier.

Consideration of Edentulous Areas by Zones

A study of the peripheral border tissues is important in making a successful semipalateless denture. As is shown in Fig. 1, Zone 1 represents the part of the border of the soft mucosa which crosses the rugae; it is highly vascular and easily compressible. Zone 2 of the periphery is rigidly compressible; the tissue is firm to palpation. Zone 3 is likewise compressible, but differs in that the tissue is elastic in nature; the mucosal layer has thinned out in this segment. In Zone 4, the line merges with elastic bands of tissue running distal to the base of the tuberosity which defines the location of the hamular notch.

Within Zone 1, there may be a continuation of the hard palate (Fig. 2). In such cases, a thin foil relief should be employed. If there is no hard area within Zone 1, the peripheral seal should be extended the entire length of this zone, only hairline in width as well as in depth. This can be done with the fine point of the small blade of a pen knife held in a light pencil grasp (Fig. 3).

The tissue in Zone 2 may be sealed with a minute degree of depth and width, tapering away from the median line (Figs. 4B and 4C). The seal in Zone 3 is broad and flat; no depth enters into the seal. The fine hairline seal is employed in Zone 4 as in Zone 1; it may be even fainter in Zone 4 than in Zone 1 (Fig. 5A). The blade of the knife is held flat against the model so that the amount removed is equivalent to a surface-scraping (Fig. 5B).

I have found that dentists, to whom I have demonstrated this technique, first make a light peripheral seal and, finding that the peripheral seal seems to aid retention, decide to cut deeper grooves, some even resorting to a heavy beading. Beading will cause resorption of the tissues underlying the peripheral seal, resulting in loss of fit later. The soft mucosa holds the denture in place; the peripheral seal is merely an adjunct in maintaining atmospheric pressure throughout the area of the denture base. The peripheral margin, which is seated on the soft mucosa, seldom requires adjustment if treated lightly.

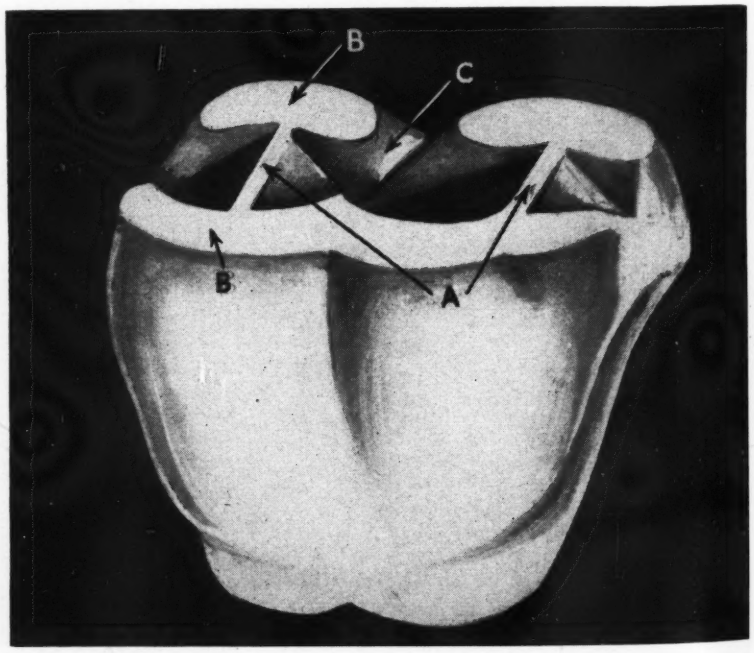

Fig. 7—Cuspless tooth with cutters: A, transverse cutters; B, milling areas; C, food clearances.

Fig. 8A

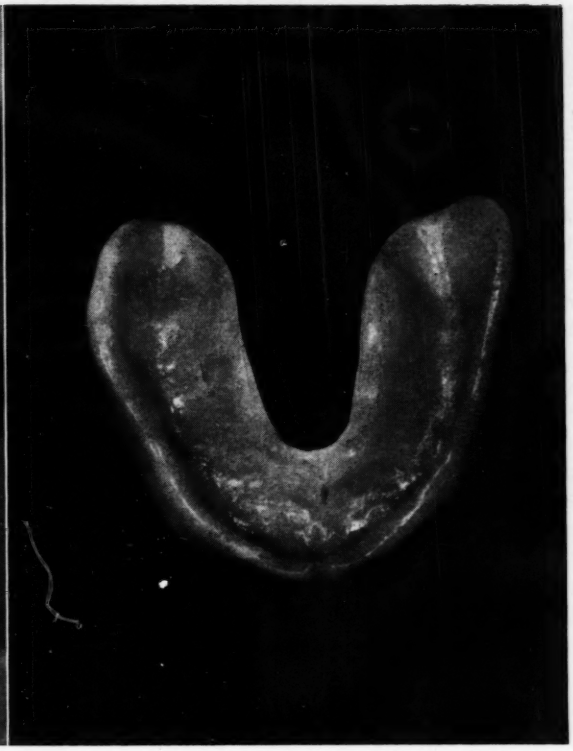

Fig. 8B

Fig. 8A—Semipalateless denture in place. Fig. 8B—Palatal view of finished denture reveals no discernible head or groove.

Mechanical Principles Underlying Denture Stability

A cross section of the bite block areas where occlusal contact must be maintained is shown in Fig. 6. If there is any occlusal contact in region B, there will be occlusal interference with resultant thrust of the denture bases upon their foundations each time the mandible moves into an eccentric position. Likewise, if there is incisal contact in region A, similar dislodgment of the dentures will take place. Region C represents the only area of contact which will seat the dentures with each stroke of mastication provided there is no cusp interference.

If the following simple principles of mechanics are followed, semipalateless dentures will outlive full palate dentures:

1. A cuspless tooth must be provided with cutters. The decreased forces which the patient can exert with artificial dentures call for an instrument or instruments which will aid in food preparation. The transverse cutters (A in Fig. 7) will prepare the food for milling by the flat surfaces (B in Fig. 7).

2. In completely edentulous cases we recommend a narrow lower tooth to complement the semipalateless denture. A special narrow lower tooth is designed for use with any of the uppers of the Myerson True-Kusp shown in Fig. 7. The narrow lower tooth lends itself to the construction of a lower denture which will conform closely to the outline of the ridge below. The cheek and tongue, instead of interfering with the denture, will aid in retaining the denture.

Indications for Roofless Denture

1. The deep vaulted palate calls for the semipalateless denture; I would say that in such a case, full palate coverage is contra-indicated.

2. This is likewise true in the mouth that presents the deep bony protuberance which it is best to circumvent. This would naturally result in a semipalateless denture.

3. It is safer to make the semipalateless denture for a mouth that presents a tough, fibrous soft palate. The soft palate branches into the hard palate with fibrous or bandlike extensions. To cross this soft palate with a postdam usually results in difficulty: when the tissue moves, it unseats the denture.

4. The semipalateless denture is indicated for an immediate restoration inasmuch as there is a constant seat for the denture because there is only one area of resorption.

Examination of hundreds of mouths with semipalateless dentures reveals the tissues in good health. This is likewise true of the soft mucosal area under a full palate coverage. The area that usually becomes inflamed is that of the hard palate and, in many cases, that of the soft palate. Fig. 8A shows the finished semipalateless denture in place; Fig. 8B shows the palatal surface of the same finished denture.

7 *Egmont Street.*

Clinical and Laboratory Suggestions*

CHESTER J. HENSCHEL, D.D.S., New York City

X. Vibrating the Inlay Pattern

In the usual procedure of applying investment to the wax pattern, the crucible former supporting the pattern is held in the left hand while the right hand applies the investment with the sable brush. The brush may be dropped to employ a vibrating instrument so as to flow the investment more easily over the pattern without trapping air bubbles. If the brush and vibrator are held in the same hand simultaneously or are combined in one instrument (a serrated brush handle), any investment left on the bristles drops off annoyingly. A simple change in technique is therefore suggested (Fig. 10):

1. Hold the pattern as usual but hold only the brush in the right hand.

2. Touch the left hand, not the crucible former, to a dental electric vibrator.

3. Varying the pressure changes the amount of vibration transmitted through the operator's fingers to the pattern. The vibration may be made sufficiently intense for excellent investment application but nevertheless so gentle that there will be no danger that the pattern will break from the sprue.

XI. Removing the Direct Wax Pattern

The use of explorers to tease a wax pattern from a retentive preparation usually produces distortion because of tilting. A pattern should be drawn out of the cavity in its line of least resistance, which is usually occlusally. Sprues fused into patterns make top-heavy and cumbersome handles inasmuch as they are of a heavy gauge; moreover, the pattern is best sprued at its bulkiest region, usually the contact point or marginal ridge, not the occlusal surface.

Excellent pattern removal can be accomplished with the aid of a handle made from a slender, pointed "U" tack-shaped piece of gold plate scrap. This may be clipped from the festooning of a band or cut for the purpose from an old crown. The gold "U" tack should be bent so that the points coincide with the marginal ridges of a mesial-occlusal-distal pattern, or the marginal ridge and central fossa of a two surface pattern (Fig. 11, Left). The pattern should be dried and the gold "U" tack should be held in heated cotton pliers, touched to sticky wax, and allowed to embed itself in the wax pattern. An explorer or one beak of the cotton pliers may be hooked under the arch of the "U" tack and the pattern lifted gently.

The "U" tack should be used as a handle during spruing or during reinsertion for refinishing. It may be removed from the pattern, if necessary, by grasping it with warmed cotton pliers, but may be allowed to remain in place during investing and casting, and cut off during polishing. Not removing the "U" tack handle obviates the necessity of warming the pattern, with consequent distortion, once it is removed from the preparation. I have found it wise not to embed the warmed sprue into the wax pattern, but to add a bead of sticky wax to a dried site on the pattern and to embed the sprue in this bead;

* These are the tenth, eleventh, twelfth, and thirteenth of the series of Clinical and Laboratory Suggestions.

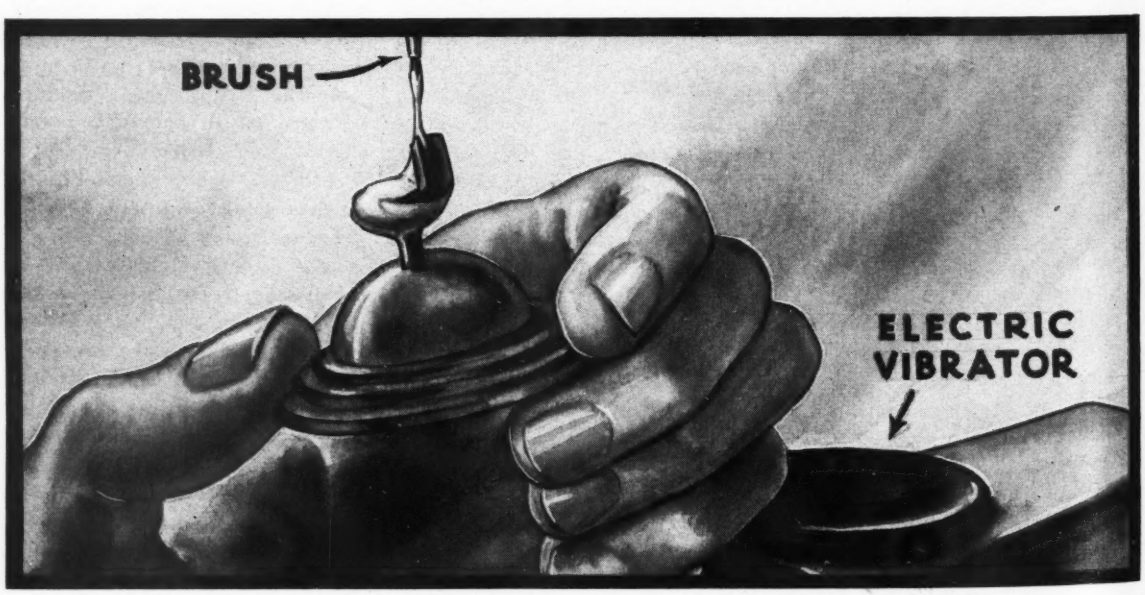

Fig. 10—A bead of fluid investment flowing from brush to pattern while small finger of left hand (or wrist) rests on vibrator.

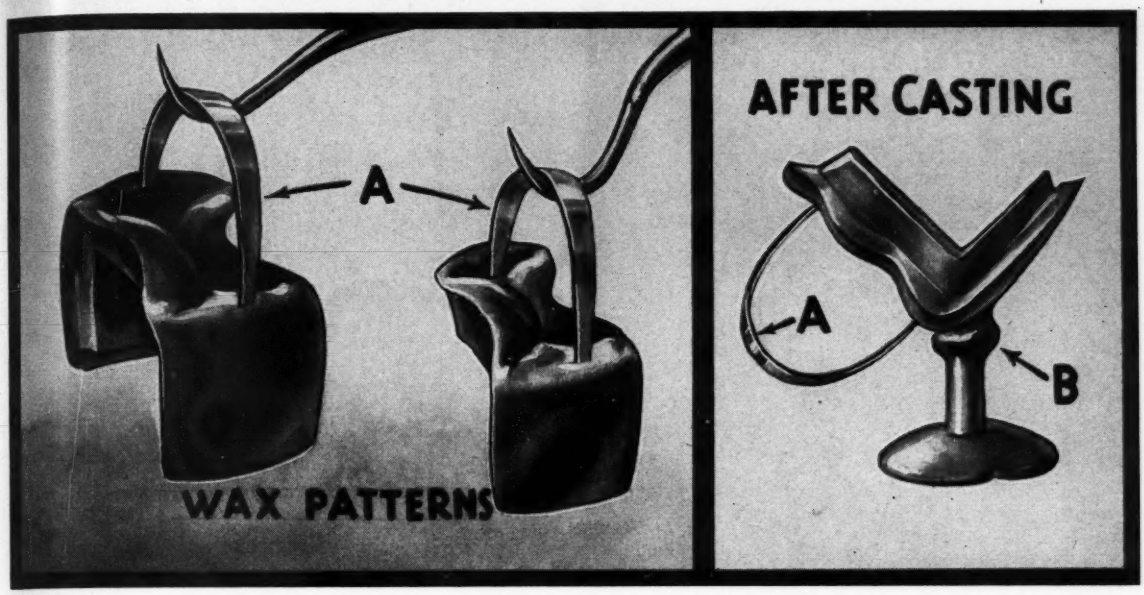

Fig. 11—Left: A, Gold "U" tack handles in position on M-O-D and two surface patterns. Right: A, "U" tack handle in position; B, bead of sticky wax for attaching sprue. A reservoir may be used in addition.

the pattern is thus insulated from the hot sprue (Fig. 11, Right).

XII. Painless Cavity Sterilization or Medication

The application of medicaments to vital dentine usually elicits pain if the drug comes from a bottle which has been kept at room temperature (about 70° F.). It is often thought that the pain accompanying the application of silver nitrate, phenol, chloroform, and alcohol is due to their chemical properties and the individual effects of the drugs on sensitive vital dentine. Pain occurs because the drugs are cold. If these drugs and most others are applied at body temperature, within the temperature tolerance zone of from 85° F. to 130° F., there will be virtually no sensation.[1]

[1]Henschel, Chester J.: Pain Control through Cold Control. DENTAL DIGEST, 47:444 (October) 1941.

Medicaments may be applied to vital dentine effectively without resultant pain by the following procedure (Fig. 12):

1. Warm the beaks of cotton pliers over the Bunsen flame until they are warm but not hot enough to burn the fingers or oral tissue.
2. Pick up a small pledget of cotton and dip it into the required reagent, withdrawing it quickly.
3. Wait a moment for the warmth

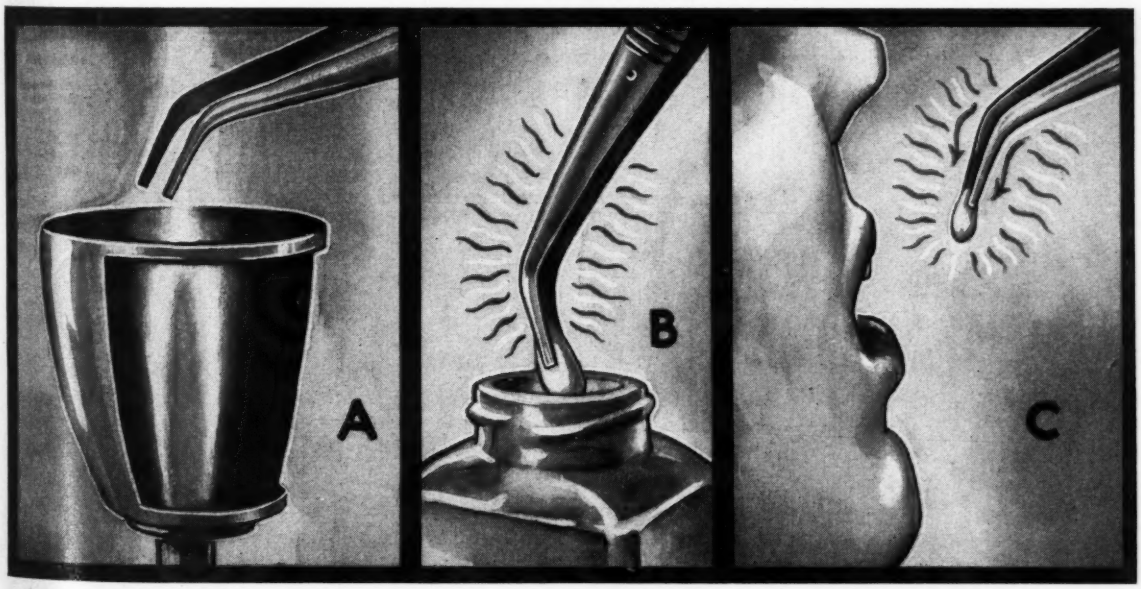

Fig. 12—A, Cotton pliers being heated over flame; B, cotton pledget held in hot pliers being dipped in medicament; C, sodden pledget warmed by pliers being applied to tooth.

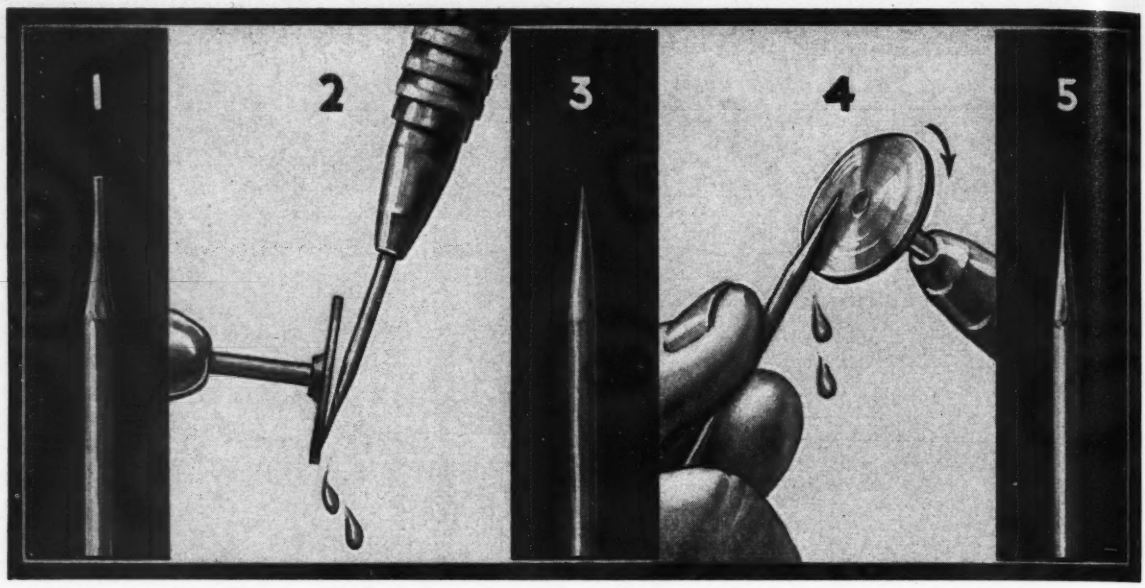

Fig. 13—1, Small broken bur; 2, bur being turned down to sharp point, both bur and disc revolving; 3, tapered, needle-like bur, temper unchanged; 4, bur being beveled on three sides; 5, small, tri-bladed spear-pointed bur for correcting minute defects on inlays.

of the metal cotton pliers to be absorbed by the heretofore cold reagent, and apply the moistened pledget to the tooth.

Do not hold the cotton or the medicament in the flame; this is unnecessary and unwise inasmuch as the chemical may be evaporated or otherwise made ineffective, and the cotton may be charred. An even more convenient method of warming medicaments is to use a water bath containing bottles of drugs which are used often. With a little practice, however, the technique described here is successful.

XIII. Small Bur for Removing Inlay Nodules

Examination with a 7 power or a 10 power jeweler's loupe often reveals correctable defects in the average inlay casting although it may have passed casual inspection. It is not an uncommon experience for a dentist, while trying to correct such a defect with a number ½ round bur and the aid of a loupe, to discover that the bur is too large for the task and, if used, would impair the casting.

A spear-pointed bur which is smaller than the number ½ bur can be made from a discarded small bur (Fig. 13):

1. Revolve the bur at low speed in a handpiece while holding it almost flat against a wet safe side disc or stone which is simultaneously revolving on a lathe or a second handpiece.

2. After the steel bur is turned down to a sharp point, it is removed, held in the fingers, and pressed against the wet revolving stone three times to bevel it into a tri-bladed spear-pointed bur.

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The Editor's Page

A LETTER from a dental officer in the Alaska Command and another written by a physician and published in the *Journal of the American Medical Association* suggest that an important research project might be undertaken by the Army Dental Corps. The dental officer in Alaska has observed that soldiers in that area are eating excessive amounts of sweets, particularly candy. It is his belief that the incidence of dental disease among these young men will be increased greatly. The lack of facilities for proper hygiene plus the inordinate consumption of sugar will undoubtedly increase the caries ratio.

The physician, commenting on the relationship between fluoride and dental caries, suggests that a geographic survey of disease be undertaken. He says: "For instance, are there other localities like Deaf Smith County, Texas, where dental caries is far below the average? And, conversely, in what districts do people have the poorest teeth? Even in Maryland, examination of army selectees has shown that those who come from the Eastern Shore have far better teeth than those who come from the western mountainous counties. And why stop with a consideration of teeth? There is a small region about twenty miles south of Rochester, New York, where the incidence of renal stones is high. A geologist called my attention to this condition and mentioned parenthetically that there was much gypsum in that area. The other side of this picture is represented by those localities that derive their drinking water from the Savannah River; gallstones and kidney stones are rare in those towns. Maine has been shown to have the highest incidence of cancer."

With millions of young Americans in military service, the Army Dental Corps has an excellent opportunity to conduct a survey of dental disease to detect possible geographic areas of origin, and to evaluate any possible relationships between zones of military service and increase in dental disease. Such a survey might encompass analyses based on ethnologic origins. We have been told that dark-complexioned southern Europeans have less dental disease than light-complexioned northern Europeans. It would be pertinent to know if this ethnologic phenomenon holds true in the second and third generations and if it is reflected in the incidence of dental disease in the Army.

The survey might make an attempt to determine if there is any significant difference in dental disease between urban dwellers and the rural population, or between people who live in maritime localities as compared with those from inland communities. It would be of value to determine whether the place of birth and the place of residence in youth has any relationship to dental disease. Certainly in such a survey among troops, individual food habits should be carefully appraised. It would be of additional interest to know if there is any relationship between the amount of sunlight to which people are exposed and dental disease. This would hold for the amount of sunlight to which a person was exposed in civil life as well as in military life. It would be significant to determine if troops in the tropics have less dental disease than those in the Alaska Command.

The Army Dental Corps has up to this point made a splendid record of quantity production. The production figures are imposing. It would be advantageous if the emphasis were shifted to an insistence on less quantity and more quality in military dentistry, and if there were something to indicate that the dental officers are concerned with more than mere reparative procedures—that they are likewise interested in a large research undertaking. It will be pitiable if this large number of young people in military service cannot be used for observation purposes to help to learn more about the nature, the incidence, and the distribution of dental disease.

Acrylic Inlays for Gingival Cavities

G. RIDGLEY PARKER, D.D.S., Ventura, California

DIGEST

A technique is presented whereby acrylic inlays may be constructed for gingival cavities by processing directly to the die. A minimum of time is required, and a maximum degree of accuracy is the result.

ACRYLIC INLAYS for gingival cavities may be constructed in a minimum amount of time and with a maximum degree of accuracy by processing directly to the die. The esthetic results are excellent if one is careful to match the shades of acrylic properly.

Technique

1. Prepare the cavity as for a gold inlay with as much depth as possible without subjecting the pulp to too much shock. A steep marginal bevel is permissible; it is even advantageous if it does not extend too deep to spoil retention (Fig. 1).

2. Contour a large copper band to fit the curvature of the tooth, with as much extension as possible mesiodistally and gingivo-incisally so that the cavity will be approximately in the middle of the band (Fig. 2). Then take the compound impression as for a direct inlay.

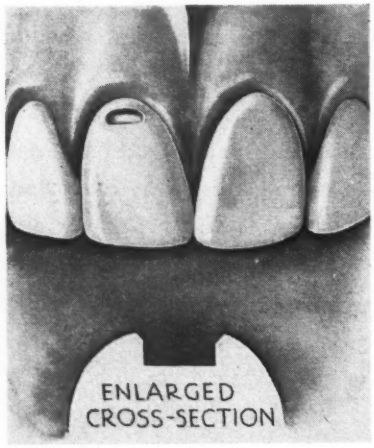

Fig. 1—Gingival cavity preparation for acrylic inlay.

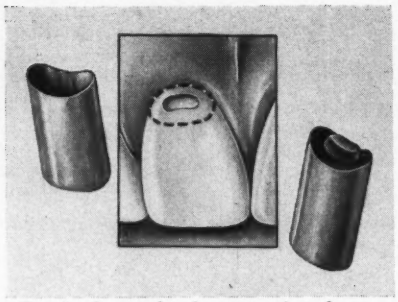

Fig. 2—Copper band contoured to fit curvature of tooth, with extension mesiodistally and gingivo-incisally so that cavity is approximately in middle of band.

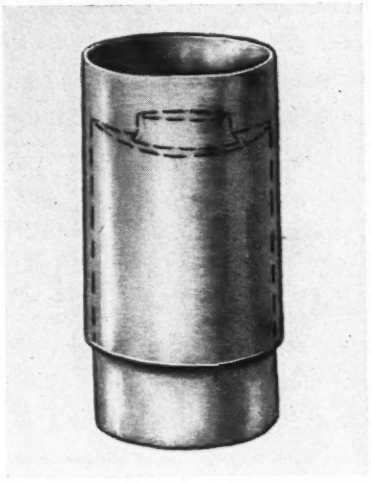

Fig. 3—Next larger size copper band fitted over first band.

3. Trim off the excess band, and fit a next larger size copper band over the band in which the impression was made. The second band should extend at least 4 mm. above the surface of the impression (Fig. 3).

4. Pack the outer band with Kryptex or a similar material, leaving considerable bulk beyond the die (Fig. 4).

5. Separate the impression from the die by removing the inside band which contains the compound (Fig. 5).

6. Cut off the outside band at the

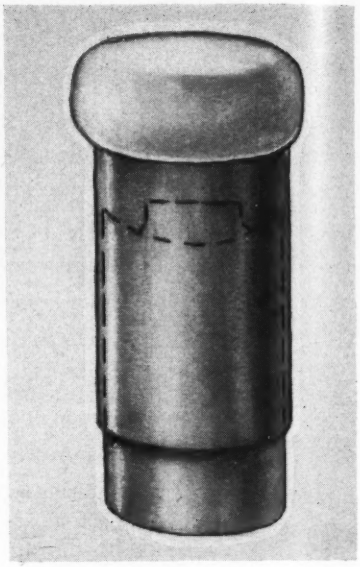

Fig. 4—Impression material packed into outer band, considerable bulk being left beyond the die.

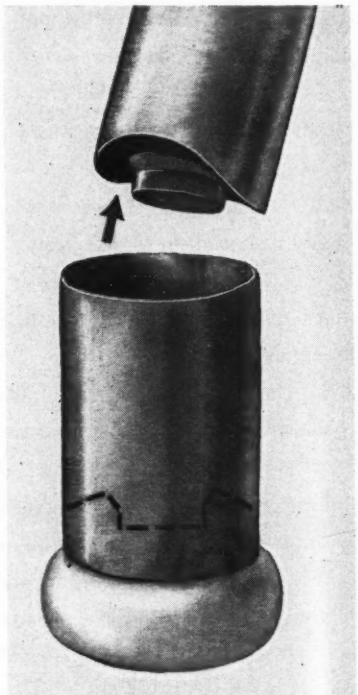

Fig. 5—Impression being separated from the die by removing the inside band with the compound.

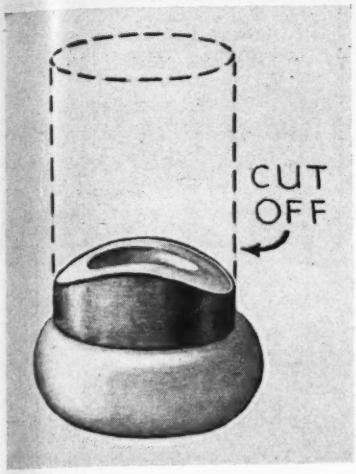

Fig. 6—Broken lines indicate outer band cut off at surface of die.

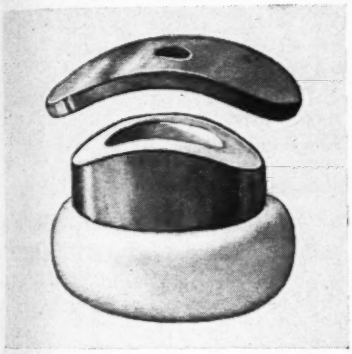

Fig. 7—Ovate sheet of unannealed copper contoured to extend beyond surface of die. Small hole drilled through sheet where it will center on cavity.

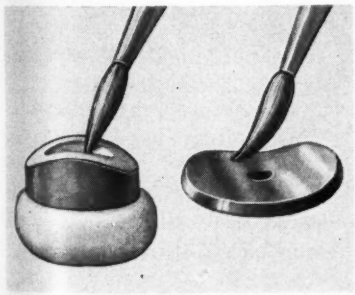

Fig. 8—Die and copper sheet being painted with separating material.

surface of the die, leaving the remainder for stability in processing (Fig. 6).

7. Contour an ovate sheet of unannealed copper (16 or 18 gauge) which is large enough to more than cover the surface of the die for compressing the acrylic material. A small hole should be drilled through the sheet at a place where it will center on the cavity in the die (Fig. 7). The hole becomes filled with acrylic material which facilitates removal of the sheet after processing.

8. Paint the die and the sheet with separating material which is contained in the packet of acrylic (Fig. 8).

9. Mix the acrylic to the proper shade and consistency, and pack the die with an excess of acrylic. Cover the packed die with cellophane, then position the metal sheet, centering the hole over the filled cavity (Fig. 9).

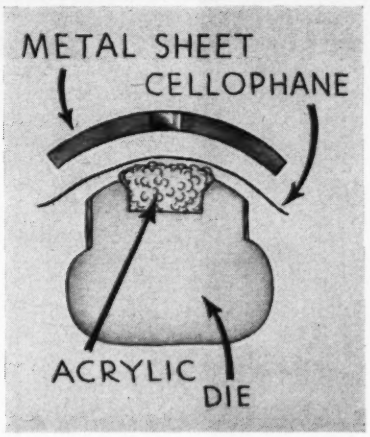

Fig. 9—Die packed with acrylic and being covered with cellophane and metal sheet; the hole is centered over filled cavity.

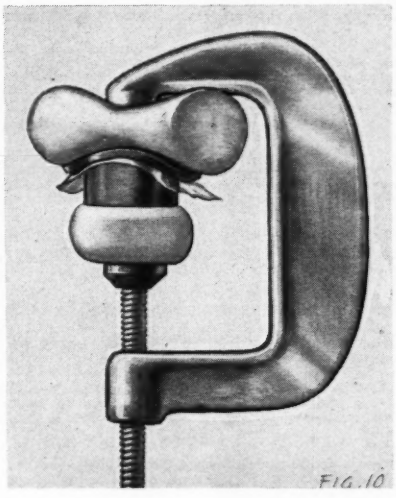

Fig. 10—Small cotton roll placed on top of metal sheet, and filled die clamped firmly in "C" clamp, prior to processing.

10. Place a small piece of cotton roll on top of the metal sheet, and clamp the filled die firmly in a "C" clamp (Fig. 10). (A spring clothespin makes an excellent clamp if the jaws are flattened to prevent slipping.) Process, cool, and separate according to the directions on the packet of acrylic.

11. The inlay may be separated easily from the metal sheet by pressing a small blunt instrument down on the excess which has been forced through the hole (Fig. 11). This leaves a projection which is convenient for trying the inlay in the prepared cavity, and prevents damage to the margins of the restoration while handling.

12. Cement the inlay in the cavity. Grind off excess acrylic, and polish the restoration (Fig. 12).

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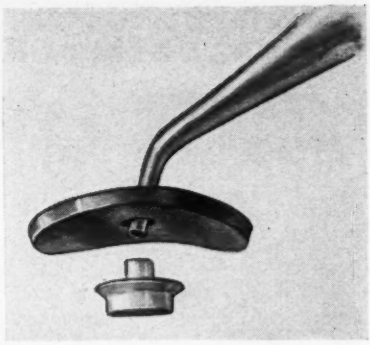


Fig. 11—Inlay being separated from metal sheet by pressing blunt instrument on excess which has been forced through the hole.

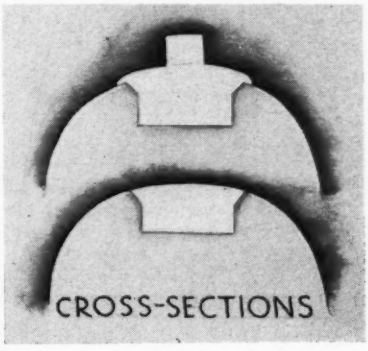


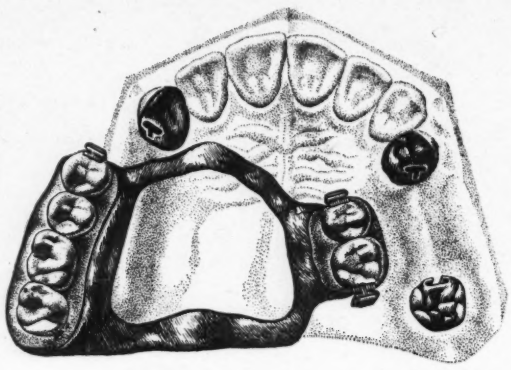
Fig. 12—Inlay cemented in cavity; excess acrylic ground off.

When Better Practice Indicates

PRECISION ATTACHMENTS

Precision attachments are indicated in this case because they eliminate need of a cumbersome continuous clasp across anteriors from cuspid to 1st bicuspid, which would be required in a clasp case in addition to clasps on the cuspid, 1st bicuspid and 2nd molar.

Therefore, attachments are more comfortable to the patient and more esthetic, avoiding the display of gold inevitable in clasps on cuspid and 1st bicuspid.



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ONE axiom has come out of the debate over the relative merits of clasp and attachment restorations—that neither type is a universal "best."

The important advantages of attachments are:

1—Life of the abutment tooth is greatly prolonged because, since the attachment is within the contour of the tooth, the stress applied is in line with its long axis; and also because possible erosion under a clasp is eliminated.

2—Esthetics is enhanced by eliminating a show of clasps, particularly on anterior teeth.

3—Attachments assure much more comfort to patient because of greater stability in a precision attachment and because all material on surfaces of teeth is eliminated.

The case illustrated is one in which "doctors agree" better practice indicates attachments for the reasons given.

Generally speaking attachments should be used:

- **when the number and location of clasps required will form a too cumbersome or unesthetic appliance;**
- **when an abutment tooth lacks normal stability; a precision attachment will by itself immobilize the tooth without addition of the indirect retainers necessary in clasp work;**
- **when abutment teeth already accommodate the required inlays or crowns.**

As makers of attachments we are as anxious to discourage their use where contra-indicated as to encourage it where indicated.

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DENTAL MEETING *Dates*

District of Columbia Dental Society, second Tuesday in each month, Medical Society Auditorium, Washington.

•

Indiana State Board of Dental Examiners, regular meeting, Indianapolis, April 24-27. For information write to Doctor C. A. Frech, Gary National Bank Building, Gary.

•

The Cleveland Dental Society, annual Spring meeting, Hotel Carter, Cleveland, May 8-10.

•

Indiana State Dental Association, eighty-seventh annual meeting, Claypool Hotel, Indianapolis, May 15-17.

•

The Women's Dental Society of New York City, regular meetings held May 17, September 20, and November 15, Hotel Pennsylvania, New York City.

•

Tennessee State Dental Association, seventy-sixth annual meeting, Hotel Peabody, Memphis, May 22-25.

•

Ontario Dental Association, seventy-seventh annual meeting, Royal York Hotel, Toronto, May 29-31.

•

New Mexico State Dental Association, annual meeting, Albuquerque, June 4-6.

•

The Northeastern Dental Society Swampscott Convention, New Ocean House, Swampscott, Massachusetts, June 11-14.

Contra-Angles

No One Likes Censorship

Those timorous souls who fear the end of the democratic way of life should be heartened by reading the ten principles set down by the Office of Censorship.[1] These ten commandments are a ringing declaration of the American way of life. They will insure the preservation of the freedom of expression. Here are the ten points:

1. Voluntary censorship must deal only with questions involving war security. If the subject matter does not relate to the war, it is not the business of censorship.

2. It must never base a request on any security consideration which may be questionable. The danger to security must be real, and must be backed by a solid and reasonable explanation.

3. It must avoid any interference whatever with editorial opinion. Such opinion could not possibly be controlled on a voluntary basis, even if it were desirable, and any attempt to do so would endanger the entire voluntary structure.

4. It must never be influenced by nonsecurity considerations of policy or public morale. Any involvement in these fields would destroy effectiveness elsewhere.

5. It must make no requests which would put the press in the position of policing or withholding from publication the utterances of responsible public officials. The complications which would result from such an effort would lead inevitably to hopeless confusion.

6. It must make every effort to avoid multiple censorship and on no account must withhold from the American public any information

[1]Release from Office of Censorship, Washington, D. C., February 19, 1944.

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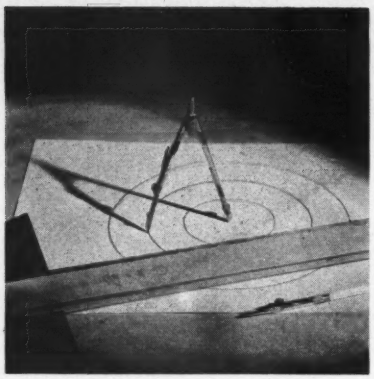

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which has been generally disseminated abroad. Its constant purpose must be to keep information from the enemy, and not from the American people.

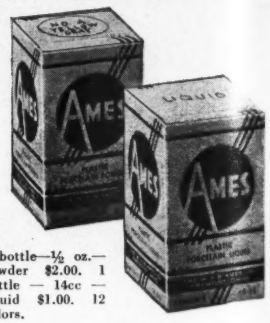
7. It must never undertake to vouch for the truth or accuracy of any news story. The embarrassments would be too great for a voluntary system, based on security, to survive.

8. It must never undertake to regulate release dates or other matters of newspaper ethics. To do so would encourage Government interference of a considerable and possibly uncontrollable character.

9. It must be absolutely impartial and consistent. If any censor is to maintain a position of influence, his blue pencil must know no brother among competitors.

10. It must operate openly, advising the public of every request made of the press. To do otherwise would undermine public confidence and foster unwarranted suspicion both against the Government and the press.

There are people in the Government, however, who would like the freedom of the press curtailed. They would like to see public expression controlled and standardized in the manner of Joe Goebbels. This same kind of thinking of the bureaucrats with a totalitarian cast to their ideas has, on occasions, found expression in dental circles. At one time the American College of Dentists appointed themselves the guardians of the dental profession. This small group of men arrogated to themselves the task of deciding what dental magazines were acceptable and who should write for them. The so-called Commission on Journalism of the American College of Dentists, made up of people who had never distinguished themselves in any journalistic undertaking, went so far as to tell the teachers in dental colleges (many of which, incidentally, are maintained by public funds) in which journals they could publish their material. At first some of the teachers accepted this ruling with timidity. In recent years, however, the spirit of independence has found resurgence among dental teachers, and they now



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In your ORAL HYGIENE this month

"I Practice in THE TOWN WITHOUT A TOOTHACHE"

Nearly everyone has heard of Hereford, Texas—now nationally known as "The Town Without A Toothache." In April ORAL HYGIENE, Doctor George W. Heard of Hereford presents an intimate view, based on his observations during forty-five years of dental practice; he suggests causes of dental caries based on his experience.

"Dentistry: Over Here and Over There," by Doctor Edward Samson, president of the British Dental Association, suggests ways to form closer ties between British and American dentists. It's a lively article you won't want to miss.

"The Patient Speaks His Mind," by Julius J. Bluestone, tells pretty bluntly what this patient, at least, expects from his dentist. Maybe you'll want to argue with the author.

"Forgotten Dentures," by Richardson Wright, reveals how the late Doctor Rodrigues Ottolengui doubled as a detective-story writer around a half-century ago.

" 'Doctors' and Dentists," by Doctor Robert H. Brotman, tells why dentists should insist on respect for their professional standing. The author recalls his article under the same title back in August, 1932, ORAL HYGIENE, which created quite a furor at the time. Maybe this one will, too.

"A Labrador Dentist" recounts the day-to-day experiences of Doctor Robert A. Chrisman, dentist for the International Grenfell Association in Newfoundland and Labrador. On the first stage of its journey to ORAL HYGIENE, Doctor Chrisman's manuscript traveled by dog team.

This month's nine departments include Picture of the Month, How to Kill a Dental Practice, Dentists in the News, Technique of the Month, Ask ORAL HYGIENE, Military News, Editorial Comment, Laffodontia, and The Publisher's Corner.

In Your April

Oral Hygiene

publish where they choose. They have thrown off the yoke of the decree of the American College of Dentists.

The dental society is a microcosm of society as a whole. In it there are found some willful, ambitious, dictatorial men; a large number of indifferent, inarticulate people; and a few vigorous champions of the democratic way of life and of advancement. The politics within dental organizations are a miniature pattern of the same thing that goes on in the National Government. One of the things that will save us as a nation from totalitarianism is the maintenance of freedom of expression. On this subject, Senator Harry F. Byrd of Virginia has spoken out in a clear and wholesome voice:[2] "It is axiomatic that if control can be established over the shape of the ideas which go into a man's head and the amount of money which flows into his pocket, there is little to fear what will come out of his mouth." The only censorship that we need is to preserve military secrets and security. When any group attempts to impose a censorship on nonmilitary expression, they should be labeled for what they are: enemies of the traditional American way of life.

Dentists should look for the danger signs within their own little worlds of dental organization. They should watch for the crackpots, the political manipulators, and the self-appointed reformers.

Our Good Neighbors

Our colleagues in Canada are closer to a form of compulsory health insurance than we are here in the United States. They are approaching the issue with good sense and without name-calling. Editor M. H. Garvin of *The Journal of the Canadian Dental Association* has written clearly and honestly on compulsory health insurance:[3]

"One is often asked what is meant by Compulsory Health Insurance. One can take it to mean that it would be compulsory for every adult in our country to contribute to the plan, and

[2]Byrd, Harry F.: Four Milestones to Totalitarianism. Reprinted from Forbes, 120 Fifth Avenue, New York.
[3]Garvin, M. H.: Compulsory Health Insurance. J. Canad. D. A., 10:127 (March) 1944.

(*Continued on page* 185)

(*Continued from page* 180)

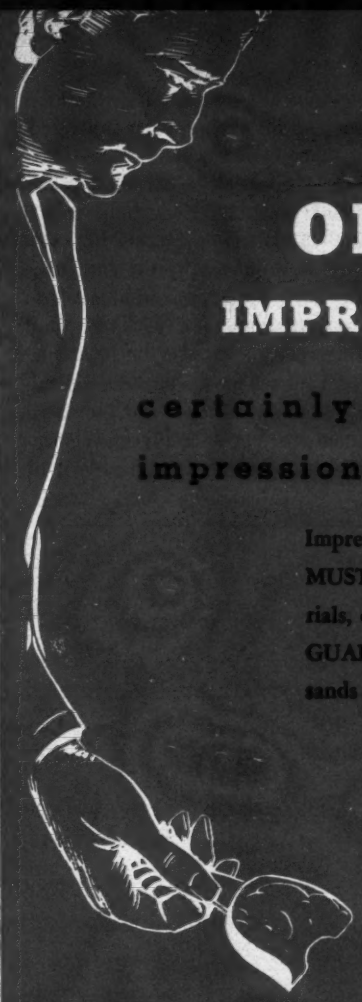
no doubt it should involve the compulsory care of the mouths of all children. It is probably not practical to make the service compulsory for adults, but on the other hand, most adults would participate in the scheme if they were paying for the service and were trained from childhood as to its advantages.

"The Canadian Medical Association has gone on record as favouring 'Compulsory Health Insurance,' under certain conditions, and why should not the Canadian Dental Association do likewise? It is more important to have a healthy nation than it is to have an educated one and we have a compulsory educational system. Furthermore, we can never hope to obtain a healthy race without some form of compulsion.

"One can be certain also that some form of Compulsory Health Insurance is inevitable before long so why 'kick against the pricks'? We are not likely to be entire masters of our own house. In the coming days what others elect to do will govern our own actions in many ways which we would not choose, if left to our own desires. One condition is whether or not we can afford Compulsory Health Insurance, or in other words will our national economy permit of the granting of such service to the populace? One thing is certain and that is that the suggested $3.60 *per caput* per year will not provide adequate dental service to any of our groups.

"The last suggestion emanating from prominent government circles in Manitoba was to the effect that children be taken care of in private offices on a *per caput* basis. Those children who are not located because no dentist will accept them are to be allocated, *pro rata,* among the dentists participating in the scheme. Under such conditions, one can imagine how extractions will be stepped up; how irregular permanent teeth will appear on every hand; how dissatisfaction will be the order of the day among all concerned. Of course dentists are opposed to this scheme and it remains to be seen what steps will be taken.

"The other conditions are that den-



"... wonder why I never used that before!

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tistry will not be unduly hurt and that the average dentist will not be asked to make too great a sacrifice. One would hope that the status of the average dentist would be greatly improved under a properly organized system of Compulsory Health Insurance. Of course, the plan should be under the control of the profession and not made a political football.

"It seems that some change in the present system of dental practice is inevitable, for the reason that people are beginning to demand dental service and rightly so, people who cannot afford service with the present dental setup. The cost of rendering this service properly is beyond the reach of the lower income group. Even the great middle class, as a group, suffer from lack of proper dental care.

"It is beside the point to say that these people spend more on tobacco, confectionery, and jewelry, than they do on medical and dental service. The fact is that they will continue to do so unless some form of compulsion is instituted and much education is given. In other words they may be able to afford professional care but they choose not to do so.

"We are all agreed if Compulsory Health Insurance is adopted in Canada that dentistry should be included.

"As to the question should everyone be included in the plan, or only those in certain low income groups, there is a great diversity of opinion. This writer believes that everyone, rich and poor alike, should be included, and that we should support this idea for several reasons:

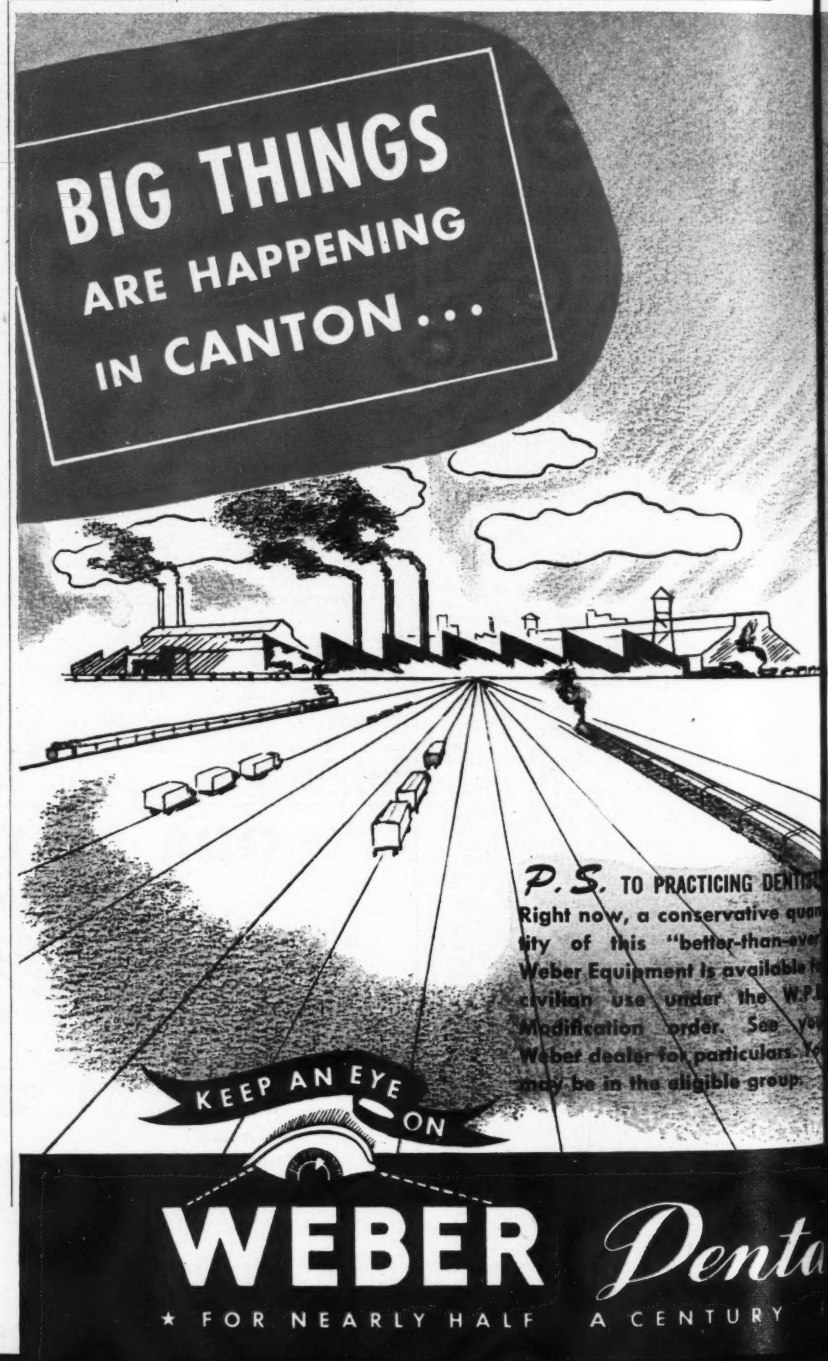
"1. If the dividing line is placed say at $2500.00, less than 10 per cent of our Canadian people would be excluded, so not much would be gained.

"2. Take two married men, one with three children earning $2600.00 and the other with no children earning $2400.00. The first man has always worked hard and saved all he could, owns his own home, and has accumulated some savings. He is not included in the insurance scheme. His wife is faced with an operation, his children have become sick, and later he has a break in health himself, but no provision is made for him. His home and his savings are confiscated. The other man has never saved anything but spent all he earned, and has a good time and lives in a rented house. Misfortune overtakes him also but he is protected by the Insurance Plan. This is so unequitable as to place a premium upon inefficiency and indifference.

"3. Under a means test, the difficulties of administration are increased tremendously as so many may be insurable this year and not next year or vice versa. Our Manitoba provincial hospital organization which would most naturally be called upon to operate such an undertaking has refused to have anything to do with a plan involving the means test.

"4. You may have many of those, who are not insured, in poor health and not receiving adequate medical or dental care, associating with those who are receiving care. This association may be to the detriment of the latter.

"5. With all children insured, the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fact that those parents above a certain income level would not be contributing to the scheme might cause dissatisfaction unless all people are forced to contribute regardless of income. If all do contribute, then it seems but fair that all should participate if they so desire. No doubt many would not wish to participate.

"To the question should the State Dental Service be a full service or as limited a service as possible, I wish to go on record as favoring the latter. I believe in private practice because I believe that dentistry will advance faster and farther if we can preserve a large proportion of private practice. I am in favor of the state dental service being limited as much as is possible, limited to the minimum that will give a reasonably efficient masticating apparatus, free from infection, and keeping in mind esthetics to the point of not unduly lowering morale, and keeping in mind also that the determination of the need for dental service shall be the prerogative of the dentist. Of course, prevention should be the keynote of this service. Preventive orthodontia also should be given a prominent place. Everything possible should be done to reduce the amount of dental caries. We should have dental hygienists in Canada and prophylactic treatment should be carried on faithfully by this group. Educational efforts should be stepped up in which the hygienist would also be of great assistance. I believe that all gold work, bridges, and jacket crowns should be delegated to private practice. If in the postwar period there still remains a large group of people who are well off financially after paying necessary taxes no doubt many of them will wish to have all their dental service rendered by the private practitioner regardless of what system is set up by the government.

"Whatever action is taken, we may at least look for increased cooperation and more widespread training and education of our people, and the setting of higher objectives toward which society will aim.

"This whole problem presents very great difficulties, but it is as Spurgeon said, 'Many men owe the grandeur of their lives to their tremendous difficulties.' We so often feel that dentistry is going to be seriously hurt by all these proposed changes but let us remember the cannon ball which struck inside the fort in one of the battles of the Crimea. It crashed into a beautiful garden but from the ugly chasm, a spring of water burst forth which flowed ever afterwards as a living fountain."

No Infection Shows

A sensible article has recently been written by Doctor A. P. Sweet in the *Journal of the Dental Society of the State of New York.*[4] Doctor Sweet pointed out these ten common radiodontic misconceptions:

1. Infection is shown in the roentgenogram.

2. An infected tooth will always be disclosed roentgenographically.

3. Antral infection can always be determined by means of the roentgenogram.

[4]Sweet, A. P.: Ten Radiodontic Misconceptions, J. D. Soc. N. Y., 9:3 (November-December) 1943.

. . . and they all began happening months before Pearl Harbor when Weber was in the midst of completing one of the biggest expansion programs the dental industry has ever seen. Today, practically everything at the Weber plant is new excepting the name . . . and that name is one which will go down in dental history not only for the outstanding job which the Weber organization is performing now for Uncle Sam but for the truly remarkable innovations in dental equipment design which will bring greater operating comfort and efficiency to thousands of Dentists when peace comes.

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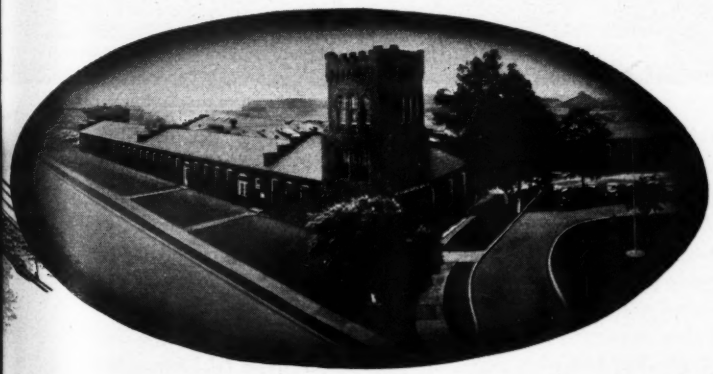

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4. When searching for infection, the periapical region is the only area of importance.

5. A thickened membrane or a radiolucent area, located periapically, always indicates infection or abscess formation.

6. Contents of radiolucent areas are shown in a roentgenogram.

7. Pulp vitality can be determined roentgenographically.

8. All cavities will be disclosed by the roentgenogram.

9. All bad margins of metallic fillings will show in a roentgenogram.

10. Root anatomy is easily studied from a single roentgenogram.

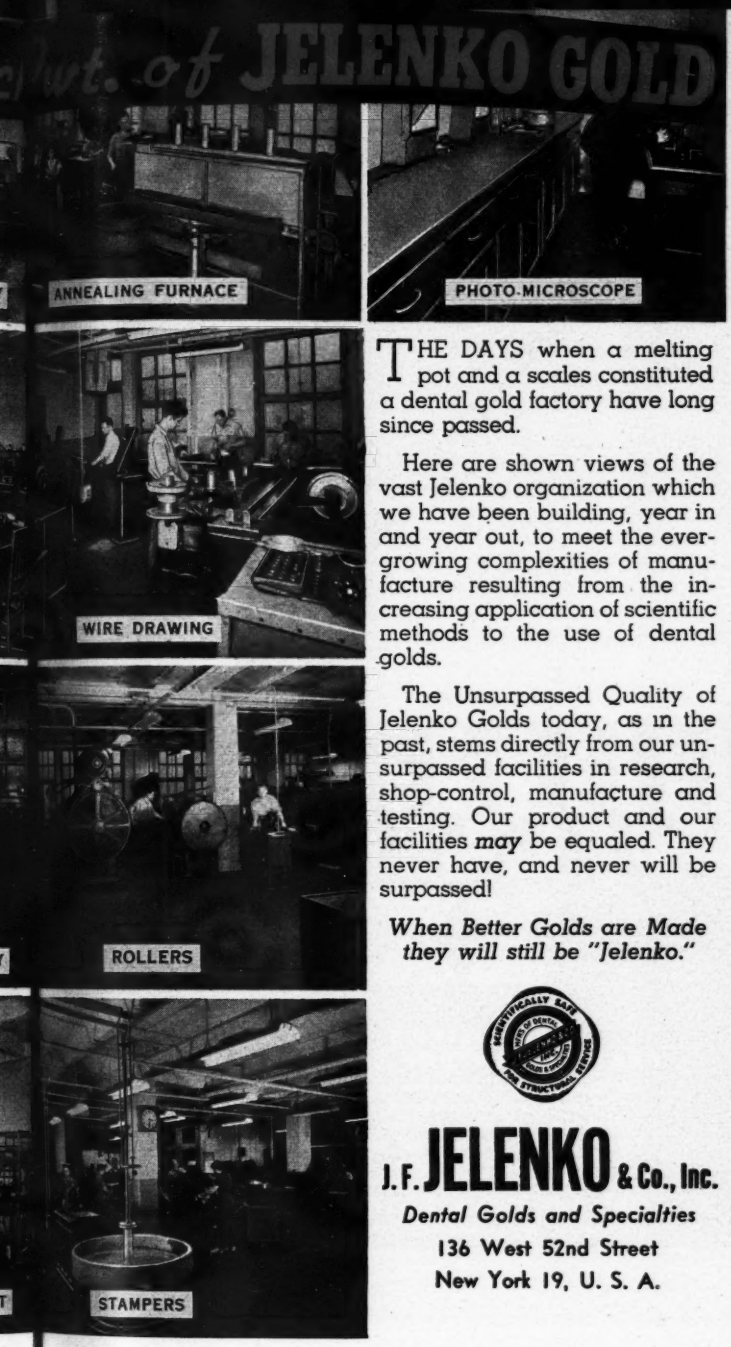
There are still many dentists who do not recognize the nature of the roentgen ray and of the roentgenogram. A roentgenogram shows nothing except differences in density of the tissue. A roentgenogram, as Doctor Sweet points out, does not show infection *per se*: infection is a biologic phenomenon. There can be infection at the root-end of a tooth without a demonstrable change in the tissues; therefore, there can be no roentgenographic evidence of disease. Conversely, there may be a radiolucent area at the apex of a tooth without infection. This change in density may be produced by chemical or mechanical means and is not necessarily an evidence of disease.

According to our present methods of diagnosis, we have no way to determine at a definite time whether a radiolucent area at the apex of a tooth represents a sterile zone, the aftermath of a onetime infection, or an actively infectious process. It would be helpful in diagnosis if we had some procedure whereby we might explore the apical areas to determine by bacterial or chemical methods if the radiolucent areas at the apexes of the teeth represent an active state of infection. According to our present methods, we are inclined to sacrifice a tooth wherever it shows a "dark" area. This cannot be considered a good diagnostic procedure.

Guard Against Sir Oracle

Henry Ford, as an industrialist, is without a superior in this country. His record, however, is not so conclusive when he enters the theater of prophecy. On March 20, Mr. Ford made the prediction that the war would be over in sixty days (May 20, 1944). The newspapers made a big story out of this pronouncement. In World War I, Mr. Ford hired a ship, *Oscar II*, which would sail for Europe, spread radio messages on the way over, and on arrival cause a wave of peace which would "get the boys out of the trenches by Christmas" of 1915. His excursion produced no results. He was off in his calculations by years. We hope that this time Mr. Ford is closer to being correct.

It is a phenomenon of American life that when a person distinguishes himself in one field, he is thought to possess a prescience in every other sphere. Mr. Ford, Mr. Lindbergh, Mr. Einstein, and Mr. Jack Dempsey have established important reputations in



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specialized fields. Their knowledge, however, does not make them authorities on military or political subjects. Keep the guard up against Sir Oracle wherever he may be found.—E. J. R.

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NEEDS YOUR HELP

Fluoride and Dental Caries

THE PROTECTIVE action of fluoride against dental caries was first indicated by epidemiologic studies which disclosed an inverse relationship between the prevalence rates of dental caries and the fluoride concentration of the municipal water supplies. Relatively low incidence of caries was found associated with the use of domestic waters whose fluoride concentration had a range of one or more parts per million. Laboratory studies revealed that salts of fluoride could inhibit the experimental production of caries in the molar teeth of rats. On the basis of this evidence, clinical investigations were undertaken in an attempt to control dental caries by the prophylactic and therapeutic use of fluoride salts.

A method was devised by Cheyne for the topical application of fluoride to the teeth without the attendant danger of its systemic ingestion or absorption: The teeth are cleaned thoroughly, then isolated by means of cotton rolls and dried with compressed air. A solution of sodium fluoride is then applied to the crown surfaces of the teeth and allowed to remain there for at least two minutes, during which the solution is dried. The effectiveness of this therapy was analyzed by Cheyne in a group of twenty-seven children with carious deciduous teeth as compared with a control group with similar lesions who did not receive treatment. After three months, dental examination showed that the treatment had effected a 50 per cent reduction in the incidence of dental caries and had been equally effective in suppressing carious activity in the pre-existing lesions. This observation was confirmed by Bibby with the topical application of 0.1 per cent solution of sodium fluoride to one quadrant of the mouth, using the other side of the same jaw as control. A 40 per cent reduction in the activity of caries in the treated quadrant was observed in a group of seventy-eight children periodically examined for two years after the treatment.

Knutson and Armstrong more recently have used the same procedures, applying topically a 2 per cent solution of sodium fluoride. Two hundred and eighty-nine treated children, as compared with 326 control children, exhibited a reduction of 40 per cent in the incidence of dental caries. In this group the treatment was ineffective in preventing new caries on teeth already attacked. This

(*Continued on page* 192)

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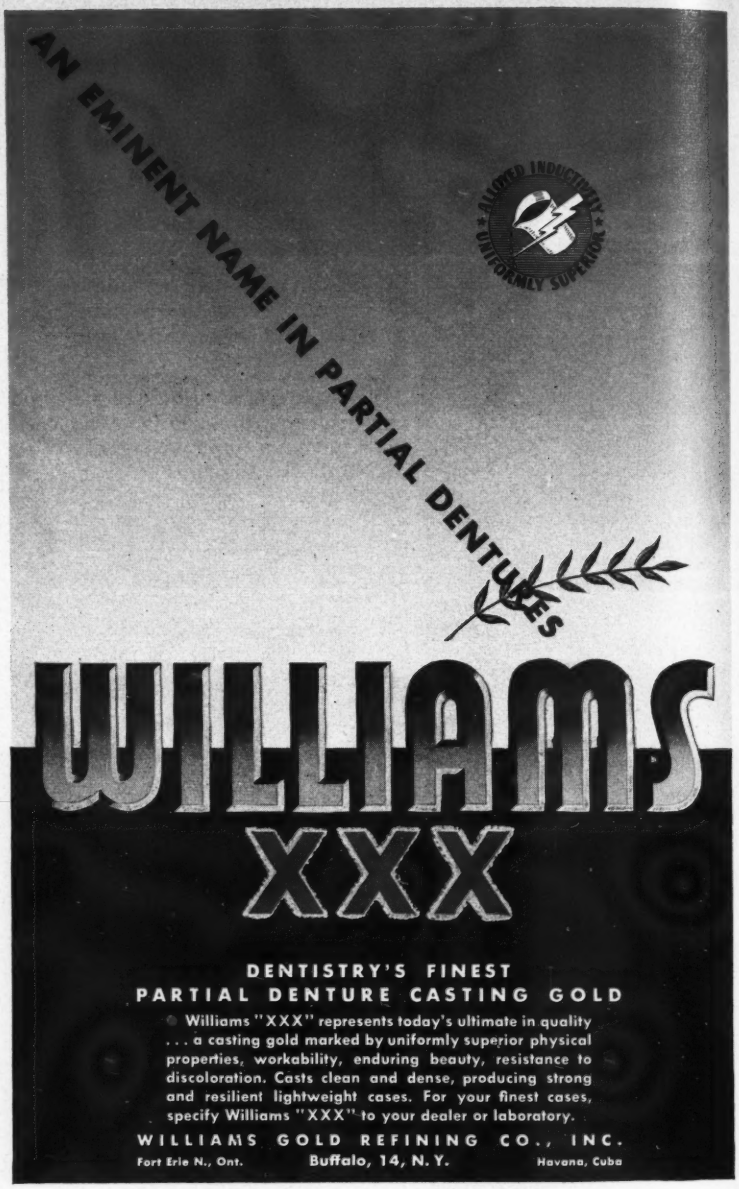
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(*Continued from page* 189)

was taken as an indication that the method was without effect in the control of active dental caries. As the analysis of activity in caries is dependent on a highly subjective criterion, further data will be required in order to warrant any definite statement as to the therapeutic effect of fluoride. Inasmuch as an excess of fluoride is bound to produce chronic dental fluorosis (mottled enamel), it is necessary to determine the minimum effective concentration of the element which will prevent carious lesions without at the same time injuring the teeth.

—From Current Comment, *J. A. M. A.*, 124:98 (January 8) 1944.

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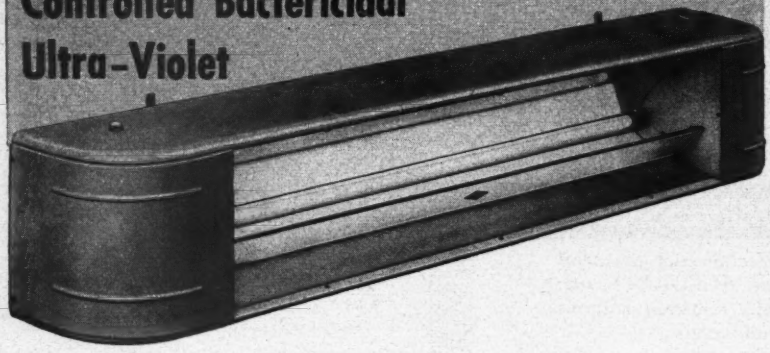

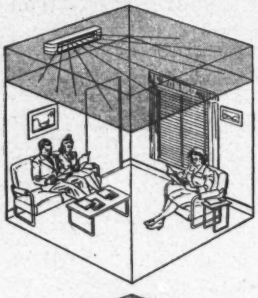

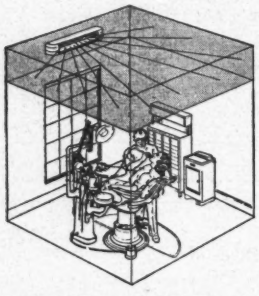

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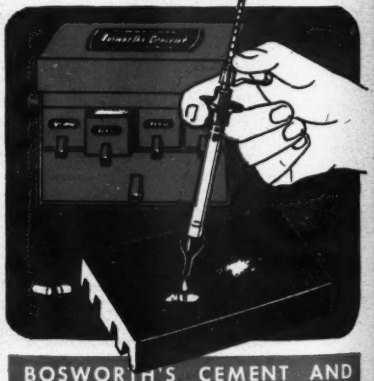

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